DRAFT HRS DOCUMENTATION RECORD--REVIEW COVER SHEET

Name of Site: Raleigh Street Dump
EPA ID No.: FLD984227249

Contact Persons

U.S. Environmental Protection Agency, Region 4:

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Documentation Record:

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Pathways, Components, or Threats Not Evaluated

The ground water migration, soil exposure, and air migration pathways were not scored. There are a limited number of nearby ground water drinking water targets for the ground water migration pathway. Ground water resources are the primary drinking water sources in Florida. No on-site residential population exists. There are a limited number of nearby residents for the soil exposure target population. No observed release to air has been documented within a 4-mile radius of the facility. Therefore, the ground water migration, soil exposure, and air migration pathways would not contribute significantly to the overall site score.

HRS DOCUMENTATION RECORD

Name of Site:	Raleigh Street Dump	EPA ID NO. FLD984227249
EPA Region:	Region 4	Date Prepared: September 2008
Street Address of Site*:	Western end of Raleigh Street, Tampa, Florida (Tampa Fiberglass, Inc., an active business in the southern portion is located at 4209 Raleigh Street, Tampa, Florida)	
County, State, Zipcode:	Hillsborough County, Florida, 33619	
General Location in the State:	Central Western Florida	
USGS Topographic Map(s):	Tampa, Florida (FL) 1956 (Photorevised [PR]1981)	

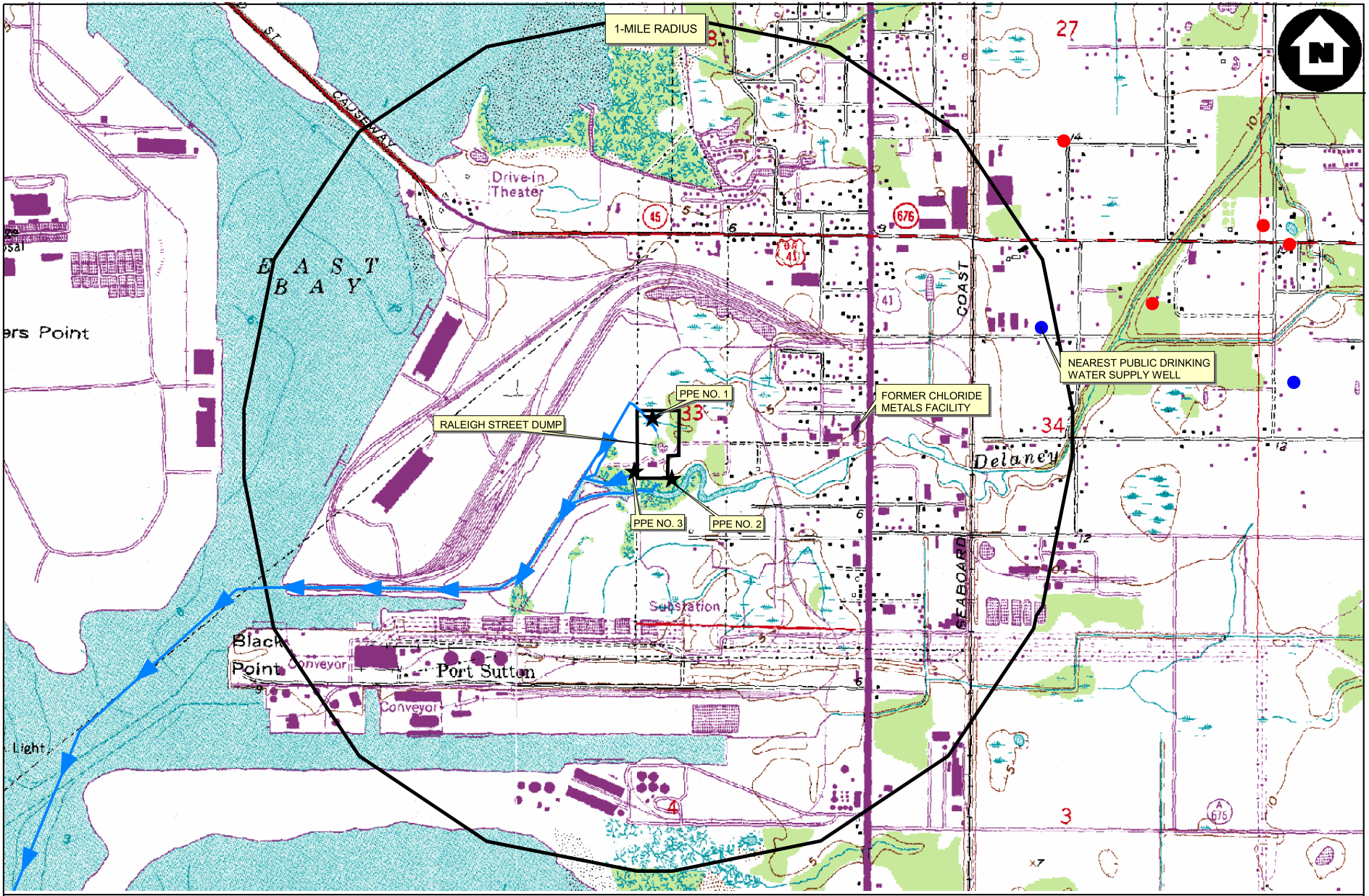
Latitude: 27° 54' 51.9" North Longitude: 82° 24' 39.1" West

The latitude and longitude coordinates were calculated from the southern portion of the site, south of the Tampa Fiberglass building. This location is within Source No. 2 and was chosen because the building is a permanent structure on the property (Refs. 3, pp. 1, 2; 23, p. 1).

* The street address, coordinates, and contaminant locations presented in this HRS documentation record identify the general area in which the site is located. They represent one or more locations EPA considers to be part of the site based on the screening information EPA used to evaluate the site for NPL listing. EPA lists national priorities among the known “releases or threatened releases” of hazardous substances; thus, the focus is on the release, not precisely delineated boundaries. A site is defined as where a hazardous substance has been “deposited, stored, placed, or otherwise come to be located.” Generally, HRS scoring and the subsequent listing of a release merely represent the initial determination that a certain area may need to be addressed under CERCLA. Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will be refined as more information is developed as to where the contamination has come to be located.

Scores

Ground Water Migration Pathway	Not Scored
Surface Water Migration Pathway	100.00
Soil Exposure Pathway	Not Scored
Air Migration Pathway	Not Scored
HRS SITE SCORE	50.00



BASE MAP IS A PORTION OF THE FOLLOWING 7.5 X 7.5' USGS TOPOGRAPHIC MAP QUADRANGLE(S): TAMPA, FLA. 1956. PHOTOREVISED 1981.

DIGITAL RASTER GRAPHIC OF USGS TOPOGRAPHIC MAP QUADRANGLE(S) OBTAINED FROM THE FDEP, DIVISION OF STATE LANDS, BUREAU OF SURVEY AND MAPPING, LAND BOUNDARY INFORMATION SYSTEM (LABINS) WEB SITE: HTTP://DATA.LABINS.ORG

PUBLIC DRINKING WATER WELL DATA OBTAINED FROM THE FOLLOWING REFERENCE MATERIAL(S): 37, pp. 1-9; 38, pp. 1-38; 39, pp. 1-19; 40, p. 1; 41, pp. 1-3; 42, pp. 1-3.

0.1 0 0.1 0.2 0.3 0.4 0.5 Miles

500 0 500 1000 1500 2000 2500 Feet

LEGEND

CONTOUR INTERVAL = 5 FEET.

- SURFACE WATER PATHWAY
- PROBABLE POINT OF ENTRY (PPE)
- NON-TRANSIENT/NON-COMMUNITY WELL
- TRANSIENT/NON-COMMUNITY WELL

SITE LOCATION MAP

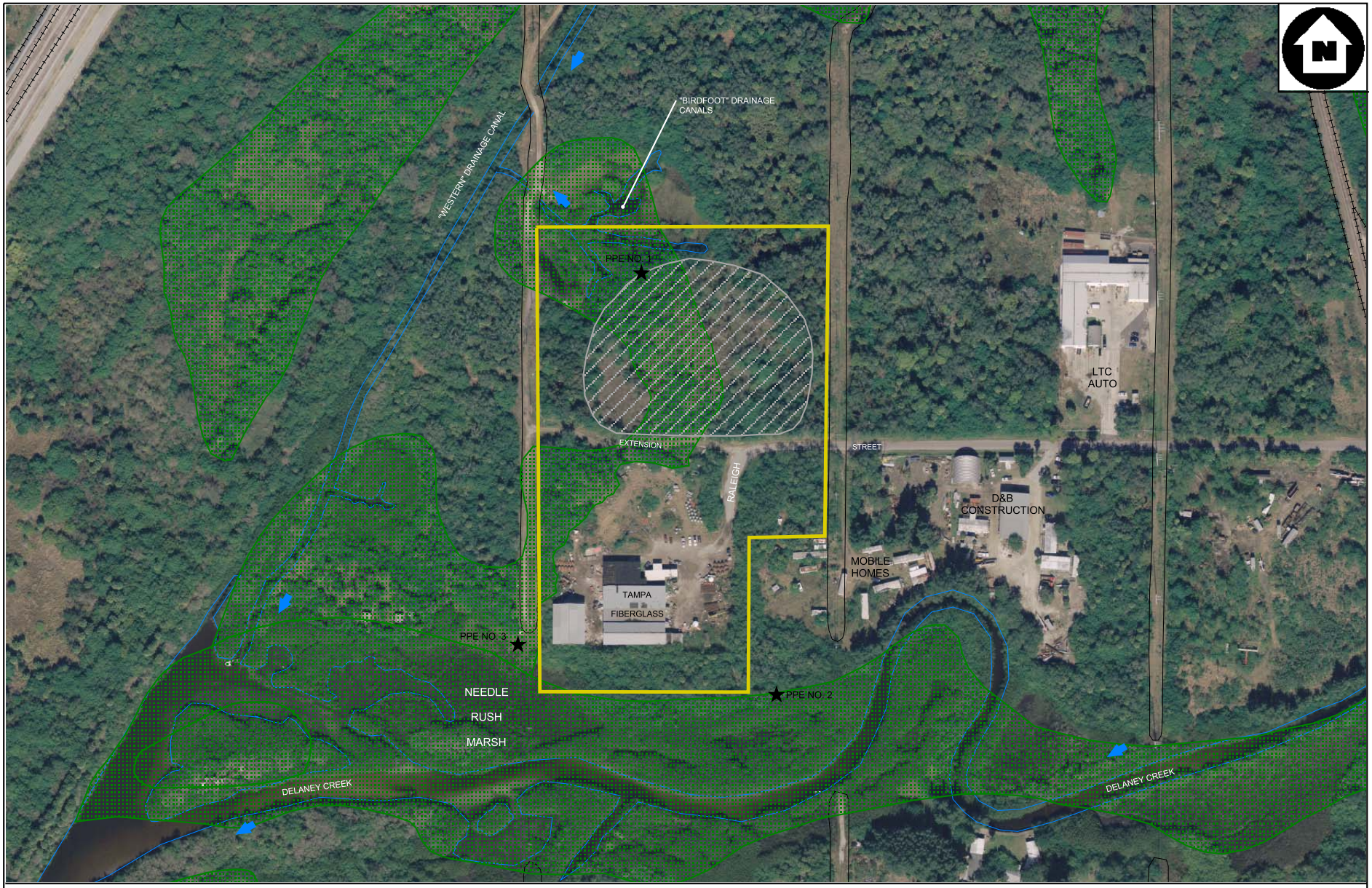
RALEIGH STREET DUMP SITE
RALEIGH STREET
TAMPA, HILLSBOROUGH COUNTY, FLORIDA
CERCLIS ID NO. FLD984227249

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WESTON SOLUTIONS Restoring Resource Efficiency

W.O. No.:	DRAWN BY:	DATE:	
12767.077.004.0625	P. SCHROT	06/09/2008	FIGURE 1

C:\GIS_DATA\ARC_APRS\RALEIGH STREET DUMP_2.APR



SOURCE(S): BASE MAP IS A PORTION OF A DIGITAL ORTHOQUARTER QUADRANGLE (DOQQ) OBTAINED FROM THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT WEB SITE: HTTP://WWW.SWFWMD.STATE.FL.US/DATA. FLY OVER DATE: 2006. RESOLUTION: 0.5 FEET.

DIGITAL WETLANDS DATA OBTAINED FROM THE U.S F&W WEBSITE: HTTP://WETLANDSFWS.ER.USGS.GOV/NWI/DOWNLOAD.HTML
NOTE(S): MUCH OF THE WETLANDS WITHIN THE SITE BOUNDARY HAVE BEEN FILLED IN. FOR A COMPARISON OF PAST AND CURRENT WETLAND BOUNDARIES, REFER TO FIGURE A-3 OF THE EPA ECOLOGICAL CHECKLIST, LOCATED IN THE MAY 2007 FINAL RI REPORT (Ref. 16).

100 0 100 200 300 400 500 Feet

★ Probable Point of Entry
Site Boundary
Source No. 1
HRS-Eligible Wetland
Easement
Water

SITE LAYOUT MAP

RALEIGH STREET DUMP SITE
RALEIGH STREET
TAMPA, HILLSBOROUGH COUNTY, FLORIDA
CERCLIS ID NO. FLD984227249

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WESTON SOLUTIONS Restoring Resource Efficiency

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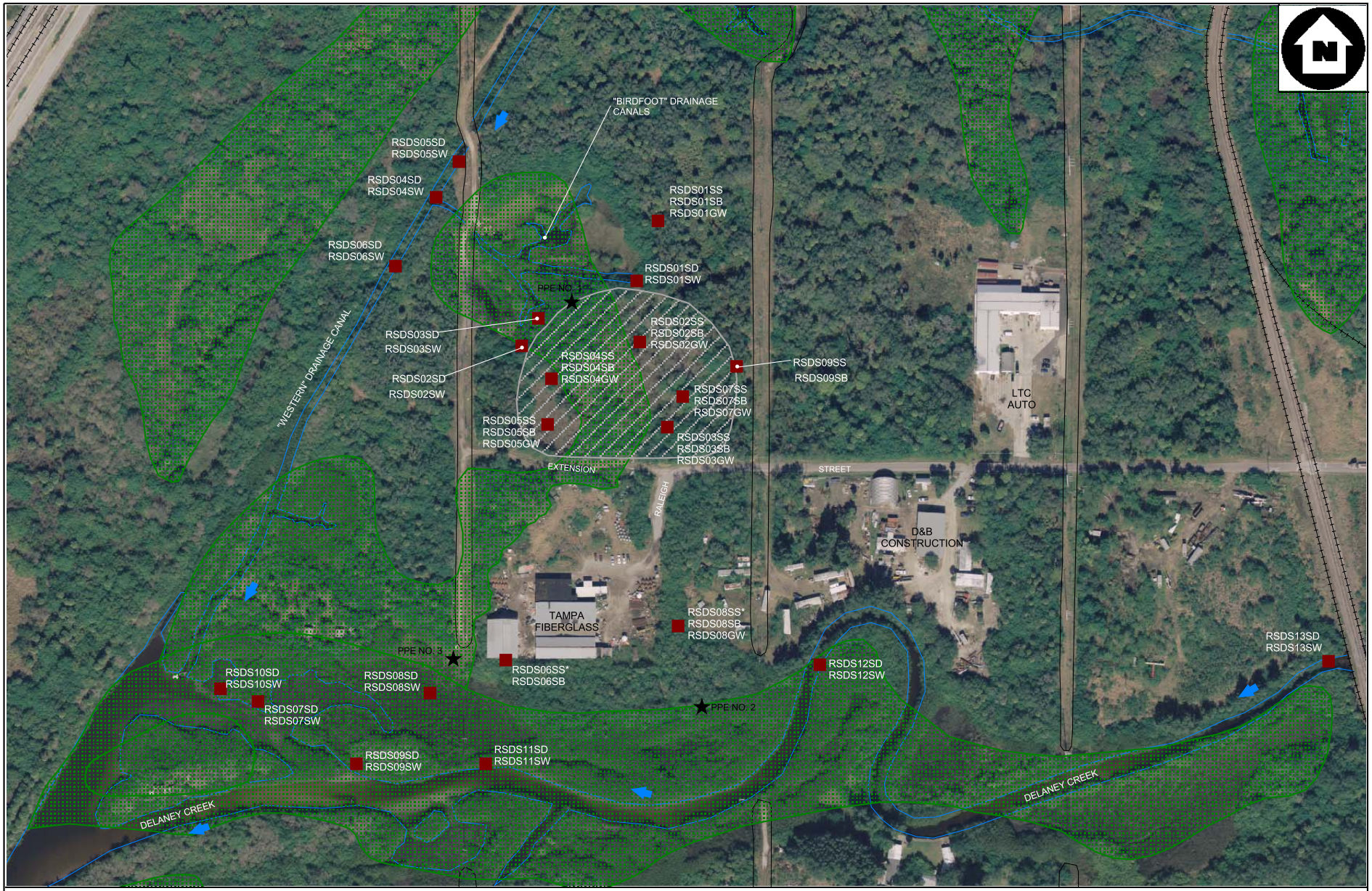
12767.077.004.0625	P. SCHROT	06/09/2008	FIGURE 2

C:\GIS_DATA\ARC_APRS\RALEIGH STREET DUMP_2.APR



SOURCE(S): BASE MAP IS A PORTION OF A DIGITAL ORTHOQUARTER QUADRANGLE (DOQQ) OBTAINED FROM THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT WEB SITE: HTTP://WWW.SWFWMD.STATE.FL.US/DATA. FLY OVER DATE: 2006. RESOLUTION: 0.5 FEET.

DIGITAL WETLANDS DATA OBTAINED FROM THE U.S F&W WEBSITE: HTTP://WETLANDSFWS.ER.USGS.GOV/NWI/DOWNLOAD.HTML

SAMPLE LOCATIONS AVAILABLE FROM THE FOLLOWING REFERENCES: 7, pp. 1-19; 9, p. 10; 16, pp. 90, 93, 96; 24, pp. 1-11; 59, Attachment No. 1.

100 0 100 200 300 400 500 Feet

★ Probable Point of Entry

Source No. 1

HRS-Eligible Wetland

Railroad Tracks

Easement

Water

■ Sample Location

*Indicates Source No. 2 (Contaminated soil) sample.

ESI SAMPLE LOCATION MAP

RALEIGH STREET DUMP SITE
RALEIGH STREET
TAMPA, HILLSBOROUGH COUNTY, FLORIDA
CERCLIS ID NO. FLD984227249

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WESTON SOLUTIONS Restoring Resource Efficiency

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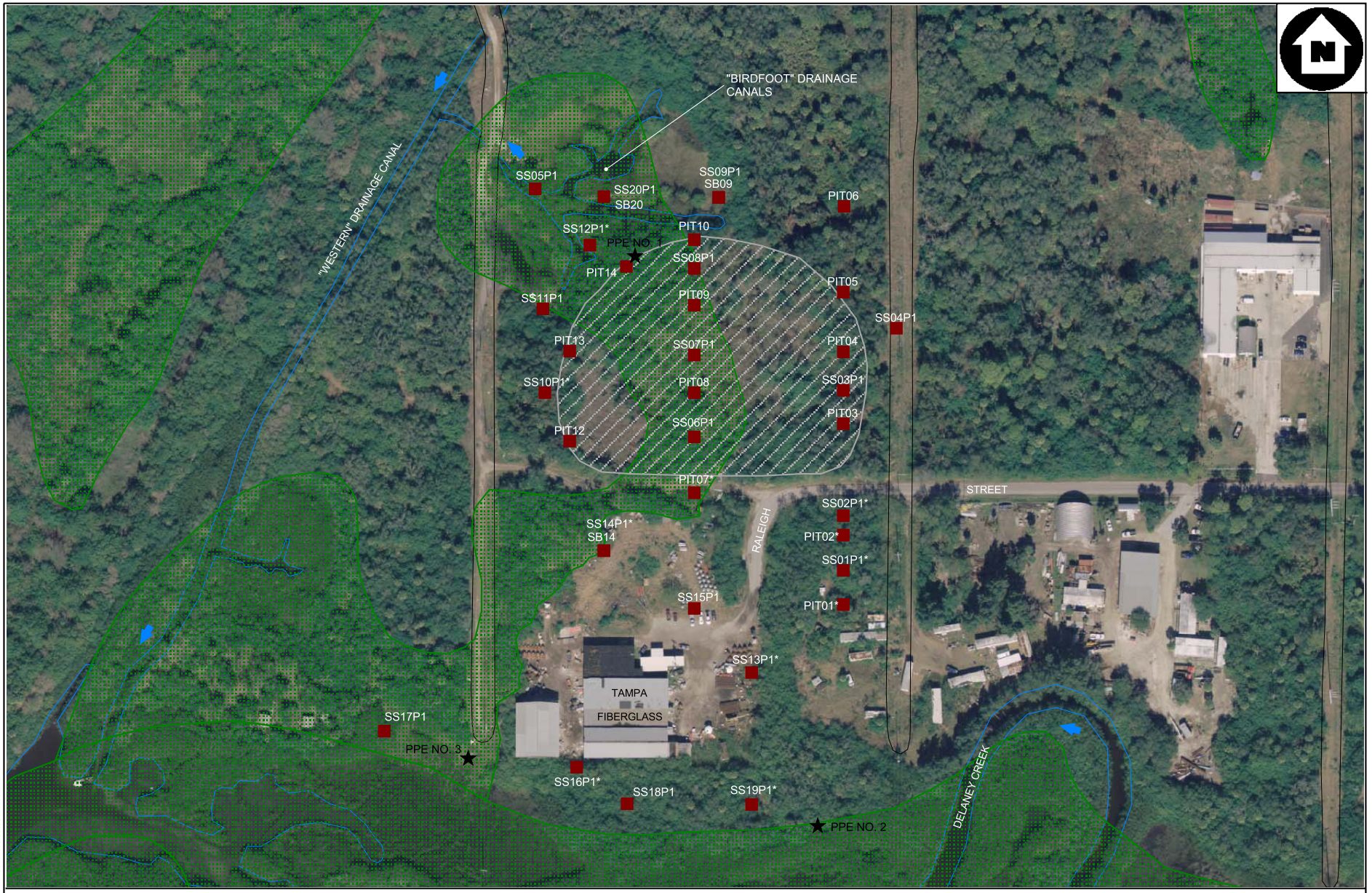
12767.077.004.0625	P. SCHROT	06/09/2008	FIGURE 3

C:\GIS_DATA\ARC_APRS\RALEIGH STREET DUMP_2.APR



SOURCE(S): BASE MAP IS A PORTION OF A DIGITAL ORTHOQUARTER QUADRANGLE (DOQQ) OBTAINED FROM THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT WEB SITE: HTTP://WWW.SWFWMD.STATE.FL.US/DATA. FLY OVER DATE: 2006. RESOLUTION: 0.5 FEET.

DIGITAL WETLANDS DATA OBTAINED FROM THE U.S F&W WEBSITE: HTTP://WETLANDSFWS.ER.USGS.GOV/NWI/DOWNLOAD.HTML

SAMPLE LOCATIONS AVAILABLE FROM THE FOLLOWING REFERENCES: 16, pp. 91, 94, 378-417; 59, Attachment No. 1.

100 0 100 200 300 400 500 Feet

★ Probable Point of Entry

Source No. 1

HRS-Eligible Wetland

Easement

Water

■ Phase 1 RI Soil Location

*Indicates Source No. 2 (Contaminated soil) sample.

PHASE 1 RI
SOIL SAMPLE LOCATION MAP

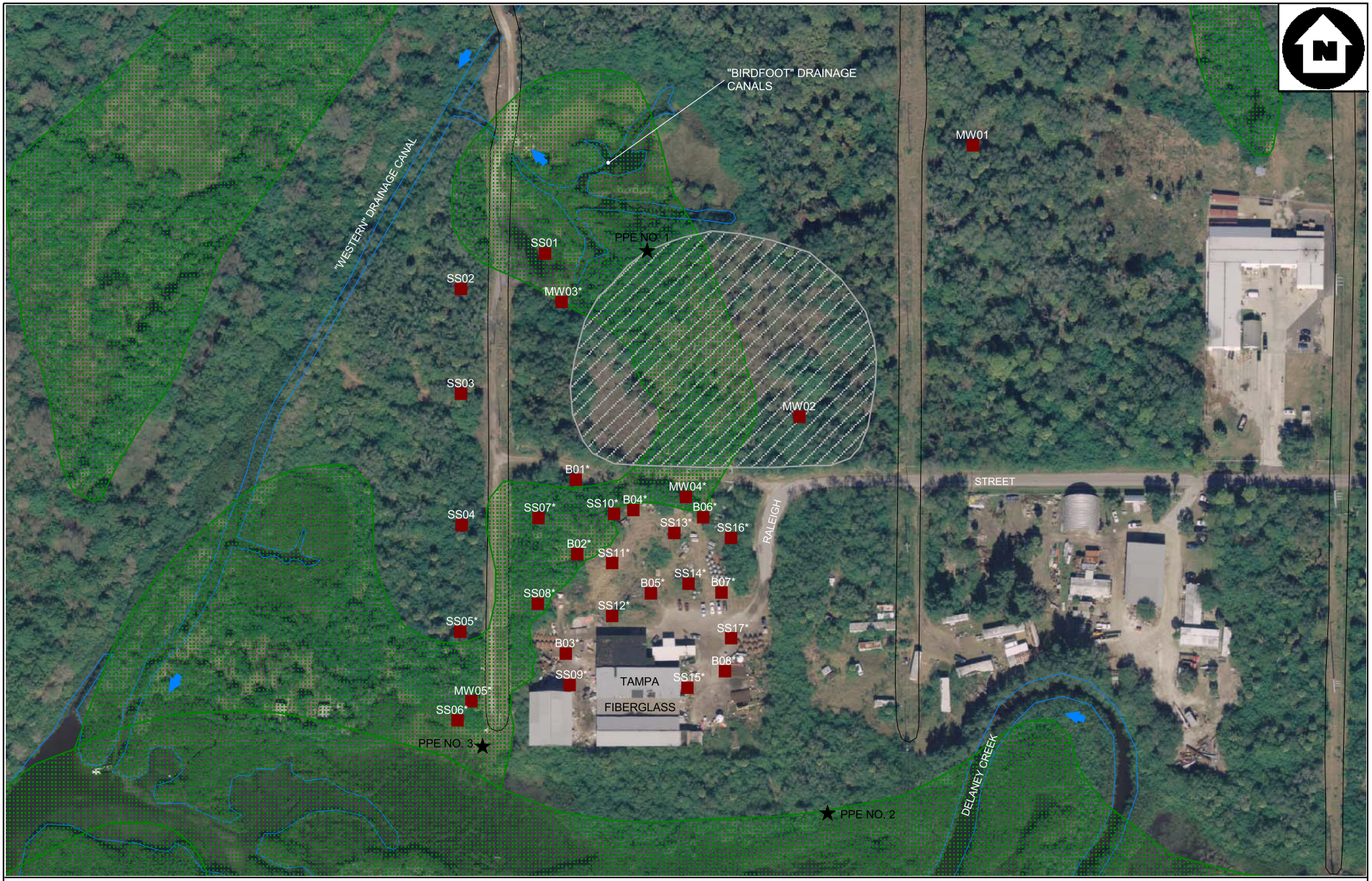
RALEIGH STREET DUMP SITE
RALEIGH STREET
TAMPA, HILLSBOROUGH COUNTY, FLORIDA
CERCLIS ID NO. FLD984227249

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WESTON SOLUTIONS Restoring Resource Efficiency

W.O. No.:	DRAWN BY:	DATE:	
12767.077.004.0625	P. SCHROT	06/09/2008	FIGURE 4

C:\GIS_DATA\ARC_APRS\RALEIGH STREET DUMP_2.APR



SOURCE(S): BASE MAP IS A PORTION OF A DIGITAL ORTHOQUARTER QUADRANGLE (DOQQ) OBTAINED FROM THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT WEB SITE: HTTP://WWW.SWFWMD.STATE.FL.US/DATA. FLY OVER DATE: 2006. RESOLUTION: 0.5 FEET.

DIGITAL WETLANDS DATA OBTAINED FROM THE U.S F&W WEBSITE: HTTP://WETLANDSFWS.ER.USGS.GOV/NWI/DOWNLOAD.HTML

SAMPLE LOCATIONS AVAILABLE FROM THE FOLLOWING REFERENCES: 16, pp. 92, 95 419-520; 59, Attachment No. 1.

100 0 100 200 300 400 500 Feet

★ Probable Point of Entry

Source No. 1

HRS-Eligible Wetland

Easement

Water

Phase 2 RI Soil Location

*Indicates Source No. 2 (Contaminated soil) sample.

PHASE 2 RI
SOIL SAMPLE LOCATION MAP

RALEIGH STREET DUMP SITE
RALEIGH STREET
TAMPA, HILLSBOROUGH COUNTY, FLORIDA
CERCLIS ID NO. FLD984227249

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WESTON SOLUTIONS Restoring Resource Efficiency

W.O. No.:	DRAWN BY:	DATE:	
12767.077.004.0625	P. SCHROT	06/09/2008	FIGURE 5

C:\GIS_DATA\ARC_APRS\RALEIGH STREET DUMP_2.APR

SOURCE(S): BASE MAP IS A PORTION OF A DIGITAL ORTHOQUARTER QUADRANGLE (DOQQ) OBTAINED FROM THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT WEB SITE: HTTP://WWW.SWFWMD.STATE.FL.US/DATA. FLY OVER DATE: 2006. RESOLUTION: 0.5 FEET.

SAMPLE LOCATIONS AVAILABLE FROM THE FOLLOWING REFERENCES: 16, pp. 99, 419-537; 59, Attachment No. 1.

50 0 50 100 150 200 250 Feet

Source No. 1

Easement

Water

Well Location

RI GROUND WATER MONITORING WELL MAP

RALEIGH STREET DUMP SITE
RALEIGH STREET
TAMPA, HILLSBOROUGH COUNTY, FLORIDA
CERCLIS ID NO. FLD984227249

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WESTON SOLUTIONS Restoring Resource Efficiency

W.O. No.:	DRAWN BY:	DATE:	
12767.077.004.0625	P. SCHROT	06/09/2008	FIGURE 6

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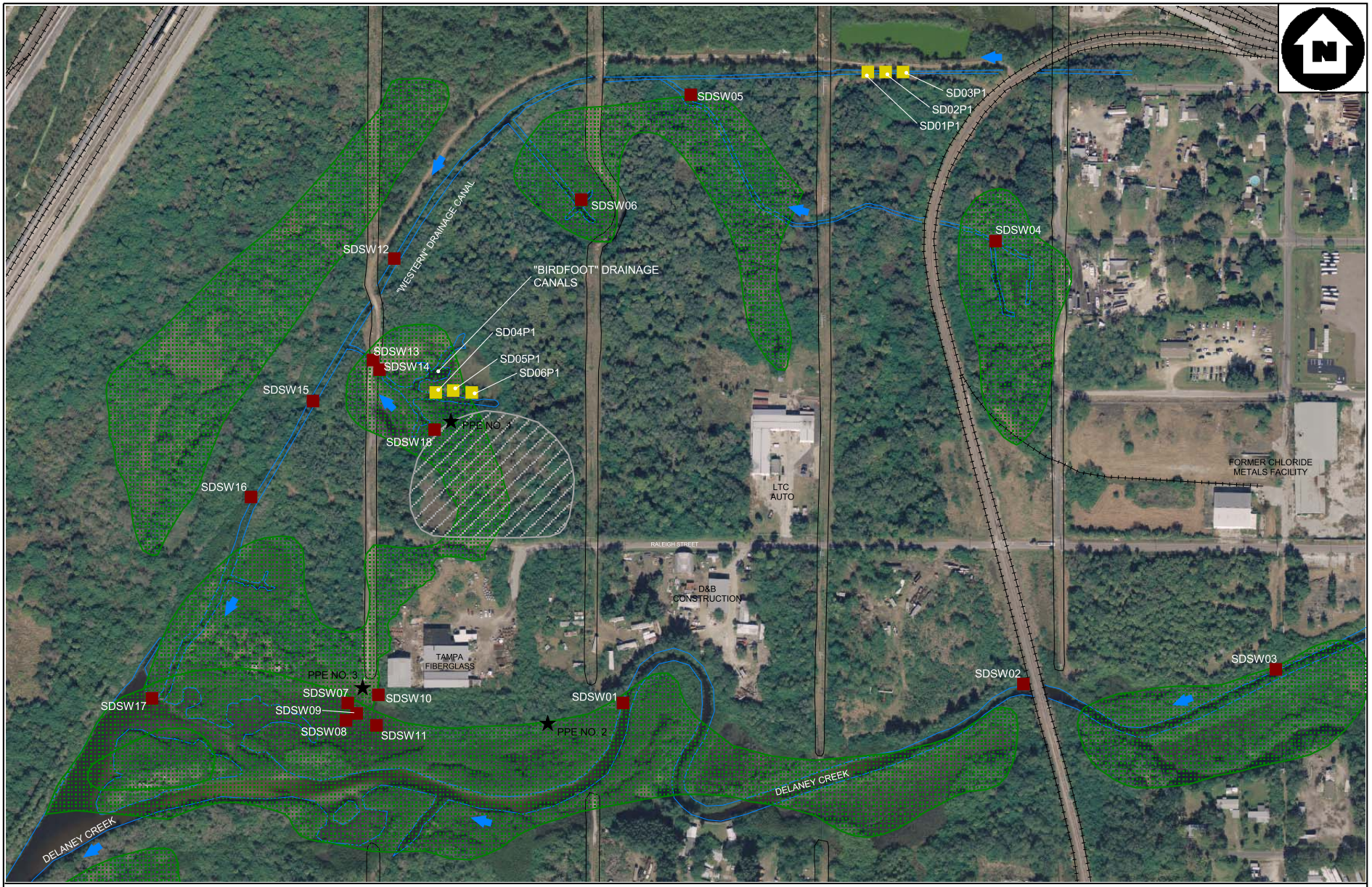

SOURCE(S): BASE MAP IS A PORTION OF A DIGITAL ORTHOQUARTER QUADRANGLE (DOQQ) OBTAINED FROM THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT WEB SITE: HTTP://WWW.SWFWMD.STATE.FL.US/DATA. FLY OVER DATE: 2006. RESOLUTION: 0.5 FEET.

DIGITAL WETLANDS DATA OBTAINED FROM THE U.S F&W WEBSITE: HTTP://WETLANDSFWS.ER.USGS.GOV/NWI/DOWNLOAD.HTML

SAMPLE LOCATIONS AVAILABLE FROM THE FOLLOWING REFERENCES: 16, pp. 97, 98, 408, 409, 509-520; 59, Attachment No. 1.

100 0 100 200 300 400 500 Feet

★ Probable Point of Entry

Source No. 1

HRS-Eligible Wetland

RI Phase 2 Sediment/ Surface Water Location

Railroad Tracks

Easement

Water

RI Phase 1 Sediment Location

PHASE I AND 2 RI SED/SW SAMPLE LOCATION MAP

RALEIGH STREET DUMP SITE
RALEIGH STREET
TAMPA, HILLSBOROUGH COUNTY, FLORIDA
CERCLIS ID NO. FLD984227249

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WESTON SOLUTIONS Restoring Resource Efficiency

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12767.077.004.0625	P. SCHROT	06/09/2008	FIGURE 7

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WORKSHEET FOR COMPUTING HRS SITE SCORE

		S	S^2
1.	Ground Water Migration Pathway Score (S_{gw}) (from Table 3-1, line 13)	NS	NS
2a.	Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	100.00	10,000
2b.	Ground Water to Surface Water Migration Component (from Table 4-25, line 28)	NS	NS
2c.	Surface Water Migration Pathway Score (S_{sw}) (Enter the larger of lines 2a and 2b as the pathway score.)	NS	NS
3.	Soil Exposure Pathway Score (S_s) (from Table 5-1, line 22)	NS	NS
4.	Air Migration Pathway Score (S_a) (from Table 6-1, line 12)	NS	NS
5.	Total of $S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$		10,000.00
6.	**HRS Site Score** (Divide the value on line 5 by 4 and take the square root)		50.00

NS = Not Scored
S = Pathway Score
S^2 = Square of Pathway Score

Site Name: Raleigh Street Dump
Site Location: Tampa, Hillsborough County, Florida

SURFACE WATER OVERLAND/FLOOD MIGRATION PATHWAY SCORESHEET

Factor Categories and Factors	Maximum Value	Value Assigned	
DRINKING WATER THREAT			
Likelihood of Release			
1. Observed Release	550	550	
2. Potential to Release by Overland Flow			
2a. Containment	10	0	
2b. Runoff	25	0	
2c. Distance to Surface Water	25	0	
2d. Potential to Release by Overland Flow (lines 2a × [2b + 2c])	500	0	
3. Potential to Release by Flood			
3a. Containment (Flood)	10	0	
3b. Flood Frequency	50	0	
3c. Potential to Release by Flood (lines 3a × 3b)	500	0	
4. Potential to Release (lines 2d + 3c, subject to a maximum of 500)	500	0	
5. Likelihood of Release (higher of lines 1 and 4)	550		550
Waste Characteristics			
6. Toxicity × Persistence	[a]	10,000	
7. Hazardous Waste Quantity (HWQ)	[a]	100	
8. Waste Characteristics	100		32
Targets			
9. Nearest Intake	50	0	
10. Population			
10a. Level I Concentrations	[b]	0	
10b. Level II Concentrations	[b]	0	
10c. Potential Contamination	[b]	0	
10d. Population (lines 10a + 10b + 10c)	[b]	0	
11. Resources	5	0	
12. Targets (lines 9 + 10d + 11)	[b]	0	
Drinking Water Threat Score			
13. Drinking Water Threat Score ([lines 5 × 8 × 12] ÷ 82,500, subject to a maximum of 100)	100		0

[a] Maximum value applies to waste characteristics category
[b] Maximum value not applicable
[c] Do not round to nearest integer
- Not evaluated

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET
(Continued)

Factor Categories and Factors	Maximum Value	Value Assigned	
HUMAN FOOD CHAIN THREAT			
Likelihood of Release			
14. Likelihood of Release (value from line 5)	550		550
Waste Characteristics			
15. Toxicity × Persistence × Bioaccumulation	[a]	5E+08	
16. Hazardous Waste Quantity (HWQ)	[a]	100	
17. Waste Characteristics	1,000		320
Targets			
18. Food Chain Individual	50	20	
19. Population			
19a. Level I Concentrations	[b]	0	
19b. Level II Concentrations	[b]	0	
19c. Potential Human Food Chain Contamination	[b]	0.0	
19d. Population (lines 19a + 19b + 19c)	[b]	0.0	
20. Targets (lines 18 + 19d)	[b]		20
Human Food Chain Threat Score			
21. Human Food Chain Threat Score ([lines 14 × 17 × 20] ÷ 82,500, subject to a maximum of 100)	100		42.67

[a] Maximum value applies to waste characteristics category
[b] Maximum value not applicable
[c] Do not round to nearest integer
\- Not evaluated
* Default value

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET
(Concluded)

Factor Categories and Factors	Maximum Value	Value Assigned	
ENVIRONMENTAL THREAT			
Likelihood of Release			
22. Likelihood of Release (value from line 5)	550		550
Waste Characteristics			
23. Ecosystem Toxicity × Persistence × Bioaccumulation	[a]	5E+08	
24. Hazardous Waste Quantity (HWQ)	[a]	100	
25. Waste Characteristics	1,000		320
Targets			
26. Sensitive Environments			
26a. Level I Concentrations	[b]	0	
26b. Level II Concentrations	[b]	100	
26c. Potential Contamination	[b]	0.2625	
26d. Sensitive Environments (lines 26a + 26b + 26c)	[b]	100.2625	
27. Targets (value from line 26d)	[b]		100.2625
Environmental Threat Score			
28. Environmental Threat Score ([lines 22 × 25 × 27] ÷ 82,500, subject to a maximum of 60)	60		60.00
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE FOR A WATERSHED			
29. Watershed Score[c] (lines 13 + 21 + 28, subject to a maximum of 100)	100		100.00
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE			
30. Component Score (S_{of})[c] (highest score from line 29 for all watersheds evaluated, subject to a maximum of 100)	100		100.00

[a] Maximum value applies to waste characteristics category
[b] Maximum value not applicable
[c] Do not round to nearest integer
- Not evaluated
* Default value

REFERENCES

Reference Number	Reference Description
1.	U.S. Environmental Protection Agency (EPA). Hazard Ranking System, 40 CFR Part 300, Appendix A, 55 FR 51583, December 14, 1990. 137 pages.
2.	EPA. Superfund Chemical Data Matrix (SCDM). January 2004. Excerpt, 51 pages.
3.	Paul H. Schrot, Senior Project Scientist, Weston Solutions, Inc. (WESTON). Project Note to file for Raleigh Street Dump, Work Order Number 12767.077.004.0625, July 11, 2007. Subject: U.S. Geological Survey maps illustrating site location and vicinity, including 4-mile radius and 15-mile downstream target distance limit. 1 page and 3 maps.
4.	EPA. Investigation Report for Chloride Metals and Battery Case Disposal Site, Tampa, Florida, November 13, 1980. 15 pages.
5.	Florida Department of Environmental Regulation (FDER). GNB, Inc. a/k/a Chloride Metals, Inc., FLD000608083, Environmental Priorities Initiative, Preliminary Assessment. June 28, 1991. 30 pages.
6.	FDER. Preliminary Assessment, Raleigh Street Dump, Hillsborough County, Florida, FLD984227249, February 25, 1993. 15 pages.
7.	Tetra Tech, EM Inc. (TT-EMI). Field Logbook #04-S-0030 for Raleigh Street Dump Site, TDD #04-0098-0008, August 25-27, 1998. 19 pages.
8.	EPA, Environmental Sciences Division. Aerial Photographic Analysis, Raleigh Street Dump, Tampa, Florida, March 1999. 37 pages.
9.	TT-EMI. Final Expanded Site Inspection Report, Raleigh Street Dump, Tampa, Hillsborough County, Florida, EPA ID No. FLD984227249. 356 pages.
10.	J. McCarthy, FDEP. Field Logbook for Town and Country Lake Estates, United Metals, June-July, 1993, McNeil Car Laundry, Raleigh Street Dump, December 1993 Reconnaissances. December 16, 1993. 23 pages.
11.	Paul H. Schrot, Senior Project Scientist, WESTON. Project Note to file for Raleigh Street Dump, Work Order Number 12767.077.004.0625, July 17, 2007. Subject: Raleigh Street Dump Site property ownership. 19 pages.
12.	Murray Wade, CDM Federal Programs, Ornithologist. E-mail to Alexis Ande, WESTON, July 31, 2001. Subject: Step 1-3a Ecological Risk for Raleigh Street Dump. 2 pages.
13.	FDEP, Site Screening Superfund Subsection. Conversation Record between Jim McCarthy, P.G., FDEP, and Eric S. Nuzie, Environmental Manager, FDEP, May 9, 1994. Subject: Plant History. 1 page.
14.	FDER. Conversation Record between Diane Trommer, FDER, Tampa District, and James LeBar, FDER, May 8, 1992. Subject: Raleigh Street Dump Site. 4 pages.
15.	FDEP. Phase II Site Inspection Narrative Report, Volumes I and II, Raleigh Street Dump Site, Hillsborough County, Florida, FLD984227249, June 6, 1994. Volume I, 83 pages. Volume II, 408 pages.
16.	Black & Veatch Special Projects Corp. May 2007. Final Remedial Investigation Report for Raleigh Street Dump Site, Tampa, Hillsborough County, Florida. 1,733 pages.

REFERENCES (Continued)

Reference Number	Reference Description
17.	Carl J. Heintz, Hillsborough County Environmental Protection Commission. Letter with attachments to Brian Moore, Florida Department of Environmental Protection (FDEP), CERCLA Site Screening Program, November 30, 1993. Subject: Raleigh Street Dump Site, Hillsborough County, EPA ID No. FLD984227249 - EPC Complaint Investigation #37752. 105 pages.
18.	Paul H. Schrot, Senior Project Scientist, WESTON. Project Note to file for Raleigh Street Dump, Work Order Number 12767.077.004.0625, June 29, 2007. Subject: Hazard Ranking System (HRS)-eligible wetland acreage located on-site and within 4 radial miles, and HRS-eligible wetland frontage located along the 15-mile surface water pathway. 24 pages, including 3 maps.
19.	Greg Harper, Senior Project Leader, WESTON. Phone Conversation Record with Jeff Willitzer, Florida Fish and Wildlife Commission. Subject: Recreational fishing along the surface water pathway of Raleigh Street Dump. Work Order Number 12767.077.004.0625, July 24, 2007. 1 page.
20.	James A. Griffin, Data Services Coordinator, Florida Natural Areas Inventory. Letter with attachments (data report) to Paul H. Schrot, WESTON. July 18, 2007. Subject: 15-Mile Downstream Surface Water Pathway for Raleigh Street Dump Site. 68 pages.
21.	U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry (ATSDR). Public Health Assessment for Raleigh Street Dump, Tampa, Hillsborough County, Florida. January 20, 2006. 67 pages.
22.	Alexis K. Ande, START-2 Project Manager, WESTON. Project Note with attachment to file for Raleigh Street Dump, TDD Number 4W-011-A-007, Work Order Number 12587-001-001-0004-00, February 26, 2002. Subject: Dump Site Area and Source No. 1. 7 pages.
23.	Paul H. Schrot, Senior Project Scientist, WESTON. Project Note to file for Raleigh Street Dump, Work Order Number 12767.077.004.0625, July 12, 2007. Subject: Latitude and longitude calculations. 3 pages, including 1 map.
24.	TT-EMI. Field Logbook #04-S-0275 for Raleigh Street Dump Site, August 24-28, 1998. 11 pages.
25.	EPA. Multi-Media, Multi-Concentration, Inorganic Analytical Service for Superfund (ILM05.3) Quick Reference Fact Sheet. OSWER Document No. 9240.1-43-FS. EPA Publication No. 540-F-04-001. February 2004. 4 pages.
26.	EPA. Multi-Media, Multi-Concentration, Organic Analytical Service for Superfund (OLM04.3) Quick Reference Fact Sheet. OSWER Document No. 9240.1-42-FS. EPA Publication No. 540-F-03-005. August 2003. 4 pages.
27.	Paul H. Schrot, Senior Project Scientist, WESTON. Project Note to file for Raleigh Street Dump, Work Order Number 12767.077.004.0625, July 29, 2008. Subject: Summary of Estimated (J-qualified) Expanded Site Inspection (ESI) Data. 5 pages.
28.	EPA. Using Qualified Data to Document an Observed Release and Observed Contamination, Quick Reference Fact Sheet, EPA 540-F-94-028, OSWER 9285.7-14fs, November 1996. 18 pages.
29.	Barbara Schuster, EPA Region 4. Electronic mail to Paul H. Schrot, WESTON. July 25, 2007. Subject: Raleigh Street Dump. 4 pages.

REFERENCES (Continued)

Reference Number	Reference Description
30.	U. S. Department of Agriculture, Soil Conservation Service. Soil Survey of Hillsborough County, Florida, 1958. Excerpt, 17 pages.
31.	Southwest Florida Water Management District. Ground-water Resource Availability Inventory: Hillsborough County, Florida, April 1988. Excerpt, 62 pages.
32.	USGS. "Types, Features, and Occurrence of Sinkholes in the Karst of West-Central Florida," Water Resources Investigations Report 85-4126, 1985. 81 pages.
33.	State of Florida, Department of Natural Resources, Division of Resource Management, Florida Geological Survey (FGS). "The Lithostratigraphy of the Hawthorn Group (Miocene) of Florida," Bulletin No. 59, 1988. Excerpt, 27 pages.
34.	State of Florida, Department of Natural Resources, Division of Resource Management, FGS. "Florida's Ground Water Quality Monitoring Program, Hydrogeological Framework," FGS Special Publication No. 32, 1991. Excerpt, 10 pages.
35.	U.S. Department of Commerce, National Oceanographic and Atmospheric Administration. "Climatic Atlas of the United States," 1983. Excerpt, 4 pages.
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General Site Description and History

Raleigh Street Dump (RSD), U.S. Environmental Protection Agency (EPA) identification (ID) number (No.) FLD984227249, is located at the western end of Raleigh Street in Tampa, Hillsborough County, Florida (Refs. 3, pp. 1-2; 36, pp, 1, 3). RSD is located in the southeastern portion of Tampa, approximately 0.5 miles west of U.S. Highway 41 (South 50 Street) (Ref. 3, pp. 1-2). The geographic coordinates for RSD, as measured from the southern portion of the property, south of the Tampa Fiberglass, Inc. (Tampa Fiberglass) building, are 27° 54' 51.9" north latitude and 82° 24' 39.1" west longitude. This location is within Source No. 2 and was chosen because the building is a permanent structure on the property (Refs. 3, pp. 1, 2; 23, p. 1).

The RSD property was previously used by Chloride Metals, Inc. (Chloride Metals), a nearby former battery manufacturing plant and secondary lead smelter which recovered lead from old lead-acid storage batteries, for the disposal of fill material containing battery casings, smelter slag, and miscellaneous debris (Refs. 4, pp. 1, 3; 5, pp. 1, 4, 5, 15, 17, 24; 6, p. 3). The former Chloride Metals facility is located approximately 0.5 miles east of RSD (see Figure 1) (Ref. 3, pp. 1, 2). “Midnight dumping” of various other waste materials, including construction and demolition debris, by unknown persons also occurred at RSD (Refs. 4, p. 3; 5, p. 3; 7, p. 15). Mr. John Manfrin, owner of the RSD property at the time of dumping, reportedly allowed dumping and used a bulldozer to spread the material over low-lying (wetland) areas and to keep the material away from the road (Ref. 4, p. 3).

Historically, the area of dumping has been reported to be approximately 3.0 to 5.0 acres; however, information is inconsistent regarding the exact size of the dump (Refs. 6, p. 1; 9, p. 2; 15, p. 1; 8, pp. 20-26; 22, p. 1). RSD is currently bisected by the westward extension of Raleigh Street, an unpaved, limestone gravel-lined service road providing access to the western power line easement (Ref. 10, pp. 1, 21). However, based on aerial photographs, the dump was active prior to the extension of Raleigh Street, indicating that waste materials may exist under the Raleigh Street extension (Ref. 8, pp. 23, 31). The areas north and south of the current Raleigh Street extension will be referred to in this Hazard Ranking System (HRS) documentation record as the northern and southern portions of RSD, respectively.

The northern portion of RSD is currently undeveloped and consists of dense vegetation, including inlets of wetlands contiguous with a series of man-made drainage ditches historically referred to as the “birdfoot” drainage canals, and dumped waste materials, including battery casings, bricks, concrete, and tires (Refs. 7, p. 15; 8, p. 31; 9, p. 2; 10, p. 3; 12, p. 1; 15, p. 7; 18, pp. 1-4, Attachment 2; 63). Prior to dumping, based on historical aerial photographs and a U.S. Geological Survey (USGS) topographic map, some of the birdfoot drainage canals extended into the southern portion of the RSD property; inlets of wetlands draining into the birdfoot drainage canals are currently on the property (Refs. 3, pp. 1, 2; 8, pp. 13-23; 12, p. 1; 18, pp. 1-4, Attachment 2; 63). The southern portion of RSD was developed between 1973 and 1974 and reportedly occupied by a semi-trailer truck repair shop operated by GNB, Inc. (formerly Chloride Metals) (Refs. 8, pp. 22-23; 9, p. 5; 13; 54, p. 2). The southern portion of RSD has been occupied by Tampa Fiberglass, Inc. (Tampa Fiberglass) since the early 1980s (Refs. 9, p. 5; 13; 15, p. 2). Tampa Fiberglass manufactures septic tanks, aircraft simulator shells, and internal tanks for wastewater treatment systems (Refs. 14, p. 1; 15, p. 2). Tampa Fiberglass consists of two buildings and two drum storage areas (Ref. 9, pp. 2, 4). Chemicals used at Tampa Fiberglass include methyl ethyl ketone (MEK), unsaturated polyester resin, ethyl acetate, methylene chloride, and acetone (Ref. 17, p. 56). Battery casing chips have been observed throughout the southern portion of RSD, in the vicinity of and south of the Tampa Fiberglass building, indicating that dumping may have extended into this area at one time (see Figure 2) (Refs. 10, pp. 1, 4, 21; 15, p. 7; 16, p. 411).

Currently, the northern portion of RSD is situated within four contiguous parcels of land owned by Atlantic Land & Improvement Company. The four parcels total approximately 4.6 acres (Ref. 11, pp. 1, 6-9). A relatively narrow piece of east-west trending land located adjacent to (north of) the Raleigh Street extension, is owned by CSX Transportation, Inc. (Ref. 11, p. 12). The southern portion of RSD is situated

within three parcels of land, two of which are contiguous (Ref. 11, pp. 1-3, 5). The largest of the three parcels is 3.2 acres and is owned by Stephen J. and Patricia J. Cook. This parcel is used by Tampa Fiberglass for their operations (Ref. 11, pp. 1, 2). The second parcel comprising the southern portion of RSD is owned by Atlantic Land & Improvement Company and consists of 0.8 acres(Ref. 11, pp. 1, 3). The third parcel comprising the southern portion of RSD is owned by Gordon G. and Donald W. MacDonald and consists of 0.5 acres. This parcel is located north of Delaney Creek and south of Tampa Fiberglass (Ref. 11, pp. 1, 5).

RSD is located in an industrial and heavy commercial area with scattered residential properties interspersed throughout the area (Ref. 16, p. 11). RSD is bordered to the east and west by north-south traversing power line easements; to the north-northwest by the birdfoot drainage canals and an undeveloped tract of land covered with dense vegetation consisting of a salt marsh wetland and a mesic forest; and to the south by Delaney Creek and a needle rush marsh wetland contiguous with Delaney Creek (Refs. 3, pp. 1, 2; 8, p. 23; 9, p. 4; 18, pp. 1-4, Attachment 2; 63). The birdfoot drainage canals flow into a canal located west of the property, referred to as the western drainage canal (Refs. 3, pp. 1, 2; 8, p. 23; 9, p. 4). The nearest residences consist of several mobile home trailers, located approximately 300 feet (ft) east of RSD (Refs. 9, pp. 4, 41, 42; 10, pp. 1, 5; 15, pp. 2, Figure 2).

RSD was discovered in 1980 during an EPA investigation of the nearby Chloride Metals facility, at which time the Chloride Metals' facility engineer stated that dumping at RSD ceased in 1978 (Ref. 4, p. 3). However, a nearby resident stated that dumping continued until July 1980 (Ref. 4, p. 3). A review of aerial photographs indicates dumping occurred from about 1977 through 1980; however, the exact dates dumping occurred are not documented (Ref. 8, pp. 20-26). The southern portion of RSD was developed around 1974, indicating that dumping may have begun around this time in order to fill low-lying areas of the site in preparation for development Ref. 54, p. 2).

The 1980 EPA investigation of the nearby Chloride Metals facility was conducted to determine if waste disposal practices at the facility had contaminated nearby surface water drainage canals and streams (Ref. 4, p. 1). The investigation revealed that RSD, along with several other properties near the Chloride Metals facility, was being used by Chloride Metals as a battery case disposal area (Ref. 4, pp. 2, 3). As part of the 1980 investigation, numerous wastewater, soil, surface water, and sediment samples were collected in and around the Chloride Metals facility, including one four-point composite soil sample (BS-2) collected from RSD (Ref. 4, pp. 1, 6, 8, 13). Analytical results of soil sample BS-2 revealed concentrations of antimony (240 mg/kg), arsenic (70 mg/kg), copper (36 mg/kg), lead (41,000 mg/kg), and zinc (320 mg/kg) (Refs. 4, pp. 6, 11; 6, p. 4A).

In 1991, the Florida Department of Environmental Regulation (FDER) completed an “Environmental Priorities Initiative Preliminary Assessment for GNB, Inc., a/k/a Chloride Metals” (Ref. 5, pp. 1, 11). During the assessment, RSD was identified as area of concern (AOC) "Z" requiring further assessment (Ref. 5, pp. 11, 15-17, 24).

In 1993, FDER completed a Preliminary Assessment (PA) of RSD (Ref. p. I). The PA summarized previous investigations and inspections of the property. No sampling was conducted as part of the PA (Ref. 6, pp. 1-9). The PA recommended further action (Ref. 6, p. 9).

In 1994, the Florida Department of Environmental Protection (FDEP), previously FDER, completed a Phase II Site Inspection (SI) of RSD (Refs. 10, pp. 1-22; 15, Volume I, p. 7, Volume II). During the SI, five surface soil and three subsurface soil samples were collected from potential on-site source areas and six surface water and seven sediment samples were collected from the birdfoot drainage canals, western drainage canal, Delaney Creek, and the needle rush marsh (Ref. 15, Volume I, pp. 9, 10, Figure 2, Table 3). In addition, two ground water samples were collected from temporary monitoring wells, and two ground water samples were collected from private wells, including the Tampa Fiberglass water supply well and a residential water supply well located east of RSD (Ref. 15, Volume I, pp. 9, 10, Figure 2, Table 3). Background samples were collected for each matrix (Ref. 15, Volume I, pp. 9, 10, Figure 2, Table 3).

Compared to the background samples, analytical results of surface and subsurface soil samples revealed elevated concentrations of several metals, including arsenic, barium, cadmium, chromium, copper, lead, nickel, and zinc (Ref. 15, Volume I, pp. 14-16, Table 5, Appendix A, Volume II). Analytical results of the sediment sample collected from the birdfoot drainage canals indicated elevated levels of metals, particularly barium, chromium, lead, manganese, mercury, vanadium, and zinc (Ref. 15, Volume I, pp. 16, 17, Tables 3 and 8, Appendix A, Volume II). Several metals were detected in the sediment samples collected from Delaney Creek. However, the background sample collected from Delaney Creek upstream of RSD contained significantly higher concentrations, particularly lead (Ref. 15, Volume I, pp. 16, 17, 22, Table 8, Appendix A, Volume II). In regards to the surface water samples, FDEP reported that no significant concentrations of metals or organic contaminants were detected (Ref. 15, Volume I, pp. 16, Table 7, Appendix A, Volume II).

Elevated concentrations of arsenic, antimony, barium, chromium, copper, lead, manganese, vanadium, and zinc were detected in the ground water sample collected from the on-site temporary monitoring well (Ref. 15, Volume I, pp. 12-14, Table 4, Appendix A, Volume II). However, the temporary well ground water samples were turbid; total (unfiltered) metal concentrations were generally higher than dissolved (filtered) metal concentrations (Ref. 15, Volume I, pp. 12, 20, Table 2). Analytical results of the private well samples did not indicate elevated concentrations of contaminants associated with RSD (Ref. 15, Volume I, pp. 12-14, 20, Table 4, Appendix A, Volume II). Moreover, FDEP reported that due to the saline nature of the coastal ground water, private wells are used primarily for sanitary purposes and bottled water is used for drinking (Ref. 15, Volume I, p. 20).

In 1998, on behalf of EPA, the Tetra Tech EM, Inc. (TT-EMI) Superfund Technical Assessment and Response Team (START) initiated an Expanded Site Inspection (ESI) of RSD. During the ESI, 9 surface soil, 9 subsurface soil, 13 surface water, 13 sediment, 7 temporary monitoring well ground water, and 2 private well ground water samples were collected (Ref. 9, p. 9). In 2001, EPA tasked CDM Federal Programs Corporation (CDM) to initiate a Remedial Investigation (RI) of RSD. The RI was divided into two phases (Phase 1 and Phase 2). Phase 1 was conducted during March 2001 and Phase 2 during August 2002. During Phase 1 , CDM collected 39 surface soil, 26 subsurface soil, and 6 sediment samples. During Phase 2, CDM collected 32 surface soil, 26 subsurface soil, 18 sediment, 18 surface water, 10 permanent monitoring well ground water, and 2 off-site private water supply well samples. In October 2005, EPA tasked Black & Veatch Special Projects Corporation (Black & Veatch) to supplement and finalize the RI initiated by CDM. Black & Veatch completed the Supplemental RI sampling in March and October 2006. The March 2006 sampling event included the collection of 10 permanent monitoring well ground water samples. The October 2006 sampling event included the collection of four subsurface soil and two permanent monitoring well ground water samples. Black & Veatch completed the final RI report in May 2007 (Ref 16, pp. 3-1 - 3-6).

From 1988 through 1992, Tampa Fiberglass was investigated for improper waste disposal practices (Ref. 17, pp. 1-105). On August 17, 1988, the Hillsborough County Environmental Protection Commission (EPC) received a complaint indicating that solid wastes generated at the Tampa Fiberglass facility were being used to fill low areas on the property (Ref. 17, p. 99). The complaint alleged that this had occurred for the past 3 years and that the landfilled areas were periodically inundated with water (Ref. 17, p. 99). On August 19, 1988, the Hillsborough County EPC performed an inspection of Tampa Fiberglass (Ref. 17, pp. 89-99). The inspection verified that wastes, such as waste sludge from distilled acetone bottoms, waste oil from an air compressor, floor sweepings, solidified polyester resins, and cans and miscellaneous items were used to landfill low-lying areas on the property, followed by a soil cap (Ref. 17, pp. 89-90). The Tampa Fiberglass landfill extended from the Tampa Fiberglass facility into the northern portion of RSD, which was also described as being in the process of being filled during the August 19, 1988 Hillsborough County EPC inspection (Ref. 17, p. 90). In addition to landfilling, wastewater from cleaning tools and brushes with acetone was allowed to flow onto the ground, and an aboveground storage tank and drums containing raw materials had no secondary containment or catch pans under their discharge nozzles (Ref. 17, p. 90). During the Hillsborough County EPC inspection, spilled product was

noted around the tank and drums (Ref. 17, p. 90). The Hillsborough County EPC recommended that all disposal of solid wastes and wastewater on the property cease, and for Tampa Fiberglass to implement proper waste management practices (Ref. 17, p. 90).

On August 30, 1988, the Hillsborough County EPC issued a Notice of Alleged Violation (NOAV) to Tampa Fiberglass regarding the violations discovered during the August 19, 1988 inspection (Ref. 17, p. 88). A subsequent inspection on January 24, 1991, indicated that Tampa Fiberglass had taken little or no action to assess and correct waste management violations (Ref. 17, pp. 30-31). On August 13, 1991, the Hillsborough County EPC requested that Tampa Fiberglass remove the improperly disposed solid wastes and perform a Preliminary Contamination Assessment Action (PCAA), in order to address potential contamination due to the violations (Ref. 17, pp. 30, 31). Following the removal and proper disposal of the solid waste, as well as analysis of soil collected from the area being landfilled revealing it was non-hazardous, the Hillsborough County EPC closed the NOAV on March 3, 1992 (Ref. 17, pp. 5, 18-23, 45, 88). The Hillsborough County EPC reported that Toxicity Characteristic Leaching Procedure (TCLP) analysis of soil samples collected from the area of solid waste disposal did not exhibit hazardous waste characteristic (Refs. 9, pp. 6, 7; 17, pp. 15-23).

Contaminants associated with the RSD were detected in soil and ground water samples collected during the 1994 SI, 1998 ESI, and 2001-2006 RI, and in surface water and sediment samples collected during the 1998 ESI and 2001-2006 RI, both of which encompassed the entire RSD disposal area (Refs. 9, pp. 21-40; 15, pp. 33-40). Compared to background samples, elevated concentrations of contaminants were detected in samples collected from the birdfoot drainage canals, the western drainage canal, and Delaney Creek and the needle rush marsh (Refs. 9, pp. 21-40; 15, pp. 33-40). The birdfoot drainage canals are a habitat for a federally endangered species (wood stork) and contain wetlands, and Delaney Creek is contiguous with the needle rush marsh wetlands (Refs. 16, pp. 142, 145, 179; 12, p. 1; 18, pp. 1-4, Attachment 2; 63). Tampa Bay and Hillsborough Bay also contain wetland frontage and are habitats for several federally designated endangered species, including the manatee, wood stork, hawksbill turtle, and leatherback turtle (Ref. 20, pp. 3-47; 18, pp. 1-4, Attachment 2; 63).

In January 2006, the Agency for Toxic Substances and Disease Registry (ATSDR), in cooperation with the Florida Department of Health (DOH), completed a Public Health Assessment for RSD (Ref. 21, p. 1, 3). ATSDR reported that metals, polycyclic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs) in on-site soil exceeded health-based screening values (Ref. 21, p. 1). DOH's evaluation of analytical data from site investigations mentioned above determined that ingestion and inhalation of chemicals in on-site soil or ground water are possible current and future exposure pathways (Ref. 21, p. 1). The Public Health Assessment concluded that RSD is a public health hazard based on evidence of trespassers and exposure to on-site soil contaminants and physical hazards (Ref. 21, p. 18).

Areas that comprise the RSD site include the dump/landfill located in the northern portion of RSD, north of Raleigh Street and its extension (Refs. 4; 5; 6; 7; 8; 9; 15; 22). In addition, based on the analytical results of soil samples, areas of contaminated soil have been documented throughout the RSD site (Refs. 9; 16). The contaminated soil exists in the southern portion of RSD, between the Tampa Fiberglass building and Raleigh Street and its extension. Areas of contaminated soil have been documented in all directions around the Tampa Fiberglass building, including to the south between the building and the wetlands contiguous with Delaney Creek (Ref. 16, pp. 91, 94, 378-417, 887-907). Analysis of soil samples collected adjacent to (west of) of the western power line easement have also documented the presence of contaminated soil (Ref. 16, pp. 92, 95, 419-520, 977-1009). Moreover, areas of contaminated soil are located in the vicinity of the birdfoot drainage canals, throughout the wetlands northwest of the dump/landfill (Ref. 16, pp. 91, 92, 94, 95, 378-417, 419-520, 887-907, 977-1009). Possible sources/releases associated with Tampa Fiberglass are not considered part of the RSD site.

SOURCE DESCRIPTION

2.2 SOURCE CHARACTERIZATION

Number of the source: 1

Name and description of the source: Dump consisting of battery casings, smelter slag, and miscellaneous debris piles

HRS Source Type: Landfill

RSD was previously used by Chloride Metals, a nearby former battery manufacturing plant and secondary lead smelter which recovered lead from old lead-acid storage batteries, for the disposal of fill material containing battery casings, smelter slag, and miscellaneous debris (Refs. 4, pp. 1, 3; 5, pp. 1, 4, 5, 15, 17, 24; 6, p. 3). "Midnight dumping" of various other waste materials, including construction and demolition debris, by unknown persons also occurred on the RSD property (Refs. 4, p. 3; 5, p. 3; 7, p. 15). The owner of the RSD property at the time of dumping reportedly allowed dumping and used a bulldozer to spread the material over low-lying (wetland) areas and to keep the material away from the road (Ref. 4, p. 3).

RSD was discovered in 1980 during an EPA investigation of the nearby Chloride Metals facility, at which time the Chloride Metals' facility engineer stated that dumping at RSD ceased in 1978 (Ref. 4, p. 3). However, a nearby resident stated that dumping continued until July 1980 (Ref. 4, p. 3). No information is available regarding the exact dates dumping occurred on the property. A review of historical aerial photographs indicates dumping occurred from about 1977 through 1980 (Ref. 8, pp. 20-26). However, waste materials, including battery casing chips, have been observed throughout the southern portion of RSD, in the vicinity of the Tampa Fiberglass building (Refs. 10, pp. 1, 4, 21; 15, p. 7). The southern portion of RSD was developed around 1974, indicating that dumping may have begun around this time in order to fill low-lying areas of the site in preparation for development (Ref. 54, p. 2). No aerial photographs of RSD are available between February 1973 and October 1977 (Ref. 8, pp. 20-26).

According to the 1994 SI, a sinkhole on the property may have originally been filled with the dumped material (Ref. 15, p. 4). Prior to dumping, based on historical aerial photographs and a USGS topographic map, some of the birdfoot drainage canals extended into the southern portion of the property (Refs. 3, pp. 1, 2; 8, pp. 13-23; 16, p. 159). Prior to the dumping and regrading of the site, almost the entire area of the RSD property contained wetlands (Refs, 16, pp. 139, 140, 143, 144, 158; 18, pp. 1-4, Attachment 2; 63). Portions of the drainage canals and surrounding wetlands have been filled by dumping, and some of the waste piles in the northern portion of RSD are reportedly surrounded by water (Refs. 12, p. 1; 16, pp. 143-145). Currently, the upper birdfoot drainage canals form the northwestern border of the northern portion of the dump; tributaries of the birdfoot drainage canals are located throughout the northern portion of the property (Refs. 9, p. 4; 12, p. 1). Dumping occurred in low-lying wetland areas and possibly in a sinkhole (a natural hole) into which wastes were disposed of by backfilling; the dumped material is conservatively characterized as a landfill because of possible layering of waste with soil during the extended period of dumping.

Information is inconsistent regarding the size of the dump. According to an analysis of available historical aerial photographs, the dump was approximately 3.0 acres in 1980 (Refs. 8, pp. 20-26; 22, p. 1). However, previous investigations of RSD have reported the dump to be approximately 5.2 acres (Refs. 6, p. 1; 9, p. 2; 15, p. 1). These discrepancies may have resulted from the changes in the physical features historically associated with this source (Refs. 8, pp. 21-27; 9, p. 10; 10, p. 1; 15, pp. 1, 2, Figure 2).

Location of the source, with reference to a map of the site:

The dumped material in the northern portion of RSD is located primarily at the surface, as evidenced by the presence of battery casings, construction debris, tires, etc. in debris piles (Ref. 7, pp. 13, 15-16, 18-19). In March 2001, as part of the RI and on behalf of EPA, CDM excavated 13 test pits on RSD, primarily north of Raleigh Street and its extension (Ref. 16, pp. 51, 91). Fill materials were encountered in 10 of the 13 test pits (Ref. 16, pp. 51, 113-120). The thickness of the landfilled material ranges in depth from 1 to 7 feet, and the ground surface at every test pit location was littered with broken battery casings, construction debris, and/or trash (Ref. 16, pp. 51, 113-120). The northern portion of RSD is currently overgrown with dense vegetation. Visible evidence of battery casing chips has been observed throughout the southern portion of RSD, in the vicinity of the Tampa Fiberglass building, indicating that dumping may have also occurred in this area (Refs. 10, pp. 1, 4, 21; 15, p. 7). However, the southern portion of RSD does not exhibit the same widespread littering of waste materials at the surface like the northern portion. In addition, test pits documenting the presence of landfilled material were primarily excavated in the northern portion of RSD, north of Raleigh Street. Moreover, a review of historical aerial photographs indicates dumping occurred primarily in the northern portion of RSD (Ref. 8, pp. 20-29). Consequently, only the northern portion of RSD is included as part of this source (see Figure 2 of this HRS documentation record).

The owner of the RSD property at the time of dumping reportedly used a bulldozer to spread the material over low-lying (wetland) areas and to keep the material away from the road (Ref. 4, p. 3). Based on historical aerial photographs, the dump was active prior to the extension of Raleigh Street, indicating that waste materials may exist under the Raleigh Street extension (Ref. 8, pp. 23, 31). The Raleigh Street extension is an unpaved, limestone gravel-lined service road providing access to the western power line easement (Ref. 10, pp. 1, 21). However, no samples have been collected from beneath Raleigh Street proper or its extension to confirm the presence of hazardous substances. In addition, no test pits have been excavated on Raleigh Street proper or its extension to confirm the presence of landfilled waste. Therefore, Raleigh Street and its extension are not included with this source (see Figure 2 of this HRS documentation record).

Containment

Release to surface water via overland flow: Fill material containing battery casings, smelter slag, miscellaneous debris, and trash and construction and demolition debris were dumped onto the northern and southern portions of RSD to fill low-lying (wetland) areas of the property (Refs. 4, pp. 1, 3; 5, pp. 1, 4, 5, 15, 17, 24; 6, p. 3; 8, pp. 21-25). Prior to dumping, based on historical aerial photographs and a USGS topographic map, some of the birdfoot drainage canals extended further into the property (Refs. 3, pp. 1, 2; 8, pp. 13-23; 16, p. 159). Currently, the upper birdfoot drainage canals form the northwestern border of the northern portion of the dump (Ref. 9, p. 4). South of the RSD property, wetlands (i.e., the needle rush marsh) are contiguous with Delaney Creek (Refs. 3, pp. 1, 2; 10, pp. 1, 21; 15, p. 21; 16, p. 58; 18, pp. 1-4, Attachment 2; 63). No dam or berm is present to prevent releases to surrounding surface water bodies. No maintained engineered cover or functioning and maintained run-on control system and runoff management system exists for the source (Refs. 12, p. 1; 16, pp. 51, 53). This information, applied to Table 4-2 in Reference 1, yields a containment factor value of 10.

2.4 WASTE CHARACTERISTICS

2.4.1 Hazardous Substances

1998 ESI Samples

During the week of August 24, 1998, as part of the ESI and on behalf of EPA, TT-EMI START collected nine surface soil samples (RSDS-01-SS through RSDS-09-SS) and nine co-located subsurface soil samples (RSDS-01-SB through RSDS-09-SB) from potential source areas at RSD (see Figure 3) (Refs. 7, pp. 10, 13-18; 9, pp. 9-13; 24, pp. 4-10; 68, pp. 1-22; 69; 70). Soil samples RSDS-SS-01 and RSDS-01-SB were collected north of RSD, northeast of the birdfoot drainage canals and upgradient of potential source areas, in order to establish reference concentrations for surface soil and subsurface soil sample comparisons, respectively (Refs. 7, p. 13; 9, pp. 10, 12-13; 24, p. 5; 68, pp. 2, 3, 17, 18). Of the nine soil sampling stations, six were located in the northern portion of RSD, in the suspected dump area, including RSDS-02-SS/SB, RSDS-03-SS/SB, RSDS-04-SS/SB, RSDS-05-SS/SB, RSDS-07-SS/SB, and RSDS-09-SS/SB (Refs. 7, pp. 10, 13-18; 9, pp. 9-13; 24, pp. 4-10).

Due to the random nature of dumping and the movement and spreading of the waste materials by heavy equipment, the analytical results of soil samples collected from within the dump area are used to characterize this source.

All surface soil samples were collected from a depth of 0 to 3 inches, and all subsurface soil samples were collected from the soil/ground water interface or at refusal, resulting in depths ranging from 2 to 4 ft (Refs. 7, pp. 10, 13-18; 9, p. 9). Sample collection depths are presented in parentheses in the analytical data table below.

The soil samples were collected using a hand auger (Refs. 7, pp. 1-19; 9, p. 9). The physical description of surface soil samples ranged from grey, silty clay and sand to black sandy topsoil. Some organic material was also observed in the surface soil samples (Ref. 7, pp. 10-19). Subsurface soil samples consisted of tan to grey, silty clay and sand (Ref. 7, pp. 10-19). The background soil samples and the soil samples from the source area were collected from similar depths, employed the same sampling method, and consisted of similar soil types (Ref. 7, pp. 1-19, Appendix A; 9, p. 9).

The table below contains elevated concentrations of hazardous substances detected in soil samples collected along the perimeter and from within the dump area. All samples were analyzed by an EPA Contract Laboratory Program (CLP) laboratory; analytical data sheets are provided in Reference 9, Appendix A. Data validation was conducted by EPA Region 4 Science and Ecosystems Division (SESD) (Refs. 9, Appendix A; 69; 70)

For each sample location, a hazardous substance is defined as being elevated if it is detected above the contract required detection limit (CRDLS) (for inorganic substances)/contract required quantitation limit (CRQL) (for organic substances) and at greater than or equal to three times the concentration detected in the background sample. However, if the hazardous substance is not detected in the background sample, the background sample’s sample quantitation limit (SQL) (for organic analysis) or sample detection limit (SDL) (for inorganic analysis) is used as the reference value. These hazardous substances are considered elevated if they occurred at a value equal to or greater than the background sample’s SQL or SDL.

The CRDLs are provided in lieu of SDLs for inorganic substances. The CRDLs are listed in Reference 25 (Ref. 25, p. 2). For organic substances, the CRQL is used instead of the SQL for samples in which the SQL is not available from the sample data (Ref. 26, p. 2).

Hazardous Substance	Evidence			SDL/CRDL/ SQL/ CRQL	Reference(s)
MATRIX: Surface Soil					
Inorganic Chemicals					
Barium	RSDS-03-SS (0 to 3 in.)	700	mg/kg	20 mg/kg	7, pp. 13, 16; 9, pp. 10, 12, Appendix A - pp. 140, 144; 25, p. 2; 68, pp. 3, 4; 69, pp. 3, 4
	RSDS-07-SS (0 to 3 in.)	560	mg/kg		
Copper	RSDS-03-SS (0 to 3 in.)	70	mg/kg	2.5 mg/kg	7, p. 13, 16, 18; 9, pp. 10, 12, Appendix A - pp. 140, 141, 144; 25, p. 2; 68, pp. 3, 4; 69, pp. 3, 4
	RSDS-04-SS (0 to 3 in.)	21	mg/kg		
	RSDS-07-SS (0 to 3 in.)	49	mg/kg		
Lead	RSDS-02-SS (0 to 3 in.)	160	mg/kg	1 mg/kg	7, pp. 13, 15, 16, 18; 9, pp. 10, 12, 13, Appendix A - pp. 139-141, 144, 146, 149, 153; 25, p. 2; 68, pp. 2, 3, 4, 7; 69, pp. 3, 4
	RSDS-03-SS (0 to 3 in.)	2,900	mg/kg		
	RSDS-04-SS (0 to 3 in.)	380	mg/kg		
	RSDS-07-SS (0 to 3 in.)	580	mg/kg		
	RSDS-09-SS (0 to 3 in.)	370	mg/kg		
Mercury	RSDS-03-SS (0 to 3 in.)	0.3	mg/kg	0.1 mg/kg	7, pp. 13, 16; 9, pp. 10, 12, Appendix A - pp. 140, 144; 25, p. 2; 68, pp. 3, 4; 69, pp. 3, 4
	RSDS-07-SS (0 to 3 in.)	0.65	mg/kg		
Zinc	RSDS-02-SS (0 to 3 in.)	130	mg/kg	6 mg/kg	7, pp. 13, 15, 16, 18; 9, pp. 10, 12, Appendix A - pp. 139-141, 144, 146; 25, p. 2; 68, pp. 3, 4, 7; 69, pp. 3, 4
	RSDS-03-SS (0 to 3 in.)	800	mg/kg		
	RSDS-04-SS (0 to 3 in.)	50	mg/kg		
	RSDS-07-SS (0 to 3 in.)	890	mg/kg		
	RSDS-09-SS (0 to 3 in.)	32	mg/kg		
Semivolatile Organic Compounds					
Acenaphthene	RSDS-03-SS (0 to 3 in.)	1,600 J* (1,600 J)	µg/kg	1,300 µg/kg	7, p. 13; 9, pp. 10, 12, Appendix A - p. 198; 27, p. 4; 68, p. 12; 70, pp. 1, 2
Anthracene	RSDS-03-SS (0 to 3 in.)	3,900 J* (3,900 J)	µg/kg	1,300 µg/kg	7, p. 13; 9, pp. 10, 12, Appendix A - p. 198; 27, p. 4; 68, p. 12; 70, pp. 1, 2

Hazardous Substance	Evidence			SDL/CRDL/ SQL/ CRQL	Reference(s)
Benzo(a) anthracene	RSDS-03-SS (0 to 3 in.)	14,000 J* (14,000 J)	µg/kg	1,300 µg/kg	7, pp. 13, 16; 9, pp. 10, 12, Appendix A - pp. 198, 204; 27, pp. 4-5; 68, pp. 12, 16; 70, pp. 1, 2
	RSDS-07-SS (0 to 3 in.)	6,700	µg/kg	4,000 µg/kg	
Benzo(b and/or k)fluoranthene	RSDS-07-SS (0 to 3 in.)	10,000 J* (10,000 J)	µg/kg	4,000 µg/kg	7, p. 16; 9, pp. 10, 12, Appendix A - p. 204; 27, p. 5; 68, p. 16; 70, pp. 1, 2
Benzo(ghi) perylene	RSDS-03-SS (0 to 3 in.)	5,700 J* (5,700 J)	µg/kg	1,300 µg/kg	7, p. 13; 9, pp. 10, 12, Appendix A - p. 198; 27, p. 4; 68, p. 12; 70, pp. 1, 2
Benzo(a)pyrene	RSDS-03-SS (0 to 3 in.)	10,000 J* (10,000 J)	µg/kg	1,300 µg/kg	7, pp. 13, 16; 9, pp. 10, 12, Appendix A - pp. 198, 204; 27, p. 4; 68, pp. 12, 16; 70, pp. 1, 2
	RSDS-07-SS (0 to 3 in.)	5,400	µg/kg	4,000 µg/kg	
Carbazole	RSDS-03-SS (0 to 3 in.)	2,500 J* (2,500 J)	µg/kg	1,300 µg/kg	7, p. 13; 9, pp. 10, 12, Appendix A - p. 198; 27, p. 4; 68, p. 12; 70, pp. 1, 2
Chrysene	RSDS-03-SS (0 to 3 in.)	14,000 J* (14,000 J)	µg/kg	1,300 µg/kg	7, pp. 13, 16; 9, pp. 10, 12, Appendix A - pp. 198, 204; 27, p. 4; 68, pp. 12, 16; 70, pp. 1, 2
	RSDS-07-SS (0 to 3 in.)	5,800	µg/kg	4,000 µg/kg	
Dibenzo(a,h) anthracene	RSDS-03-SS (0 to 3 in.)	2,200 J* (2,200 J)	µg/kg	1,300 µg/kg	7, p. 13; 9, pp. 10, 12, Appendix A - p. 198; 27, p. 4; 68, p. 12; 70, pp. 1, 2
Fluoranthene	RSDS-03-SS (0 to 3 in.)	28,000 J* (28,000 J)	µg/kg	1,300 µg/kg	7, pp. 13, 16; 9, pp. 10, 12, Appendix A - pp. 198, 204; 27, p. 4; 68, pp. 12, 16; 70, pp. 1, 2
	RSDS-07-SS (0 to 3 in.)	14,000	µg/kg	4,000 µg/kg	
Fluorene	RSDS-03-SS (0 to 3 in.)	1,700 J* (1,700 J)	µg/kg	1,300 µg/kg	7, p. 13; 9, pp. 10, 12, Appendix A - p. 198; 27, p. 5; 68, p. 12; 70, pp. 1, 2
Indeno(1,2,3-cd)pyrene	RSDS-03-SS (0 to 3 in.)	8,000 J* (8,000 J)	µg/kg	1,300 µg/kg	7, p. 13; 9, pp. 10, 12, Appendix A - p. 198; 27, p. 5; 68, p. 12; 70, pp. 1, 2
Phenanthrene	RSDS-03-SS (0 to 3 in.)	16,000 J* (16,000 J)	µg/kg	1,300 µg/kg	7, p. 13; 9, pp. 10, 12, Appendix A - p. 198; 27, p. 5; 68, p. 12; 70, pp. 1, 2
Pyrene	RSDS-03-SS (0 to 3 in.)	21,000 J* (21,000 J)	µg/kg	1,300 µg/kg	7, pp. 13, 16; 9, pp. 10, 12, Appendix A - pp. 198, 204; 27, p. 5; 68, pp. 12, 16; 70, pp. 1, 2
	RSDS-07-SS (0 to 3 in.)	9,700	µg/kg	4,000 µg/kg	

Hazardous Substance	Evidence			SDL/CRDL/ SQL/ CRQL	Reference(s)
MATRIX: Subsurface Soil					
Inorganic Chemicals					
Arsenic	RSDS-02-SB (2 to 2.5 ft)	4.25 J* (7.4 J)	mg/kg	1 mg/kg	7, p. 15; 9, pp. 10, 13, Appendix A - p. 148, 149; 25, p. 2; 27, p. 3; 68, p. 7; 69, pp. 3, 4
Chromium	RSDS-03-SB (3 to 3.5 ft)	15	mg/kg	1 mg/kg	7, pp. 13, 16; 9, pp. 10, 13, Appendix A - pp. 149, 153; 25, p. 2; 68, pp. 2, 4; 69, pp. 3, 4
	RSDS-07-SB (3.5 to 4 ft)	13	mg/kg		
Cyanide	RSDS-03-SB (3 to 3.5 ft)	3.7	mg/kg	2.5 mg/kg	7, p. 13; 9, pp. 10, 13, Appendix A - p. 149; 25, p. 2; 68, p. 2; 69, pp. 3, 4
Lead	RSDS-03-SB (3 to 3.5 ft)	9.8	mg/kg	1 mg/kg	7, pp. 13, 15, 16, 18; 9, pp. 10, 12, 13, Appendix A - pp. 139-141, 144, 146, 149, 153; 25, p. 2; 68, pp. 2, 3, 4, 7; 69, pp. 3, 4
	RSDS-07-SB (3.5 to 4 ft)	8.2	mg/kg		
Vanadium	RSDS-03-SB (3 to 3.5 ft)	32	mg/kg	5 mg/kg	7, p. 13; 9, pp. 10, 13, Appendix A - p. 149; 25, p. 2; 68, p. 2; 69, pp. 3, 4

Notes:

Adjustment of qualified source analytical data is not required, per Reference 28. However, since soil samples are being used to associate hazardous substances with on-site sources and are being compared to background sample concentrations, the adjustment makes the source evaluation conservative.

For J-qualified analytical results, the original concentrations are presented in parentheses.

CRDLS - Contract Required Detection Limit
SDL - Sample Detection Limit
SQL - Sample Quantitation Limit
CRQL - Contract Required Quantitation Limit
RSDS - Raleigh Street Dump Site
SS - Surface soil
SB - Subsurface soil
mg/kg - Milligrams per kilogram
µg/kg - Micrograms per kilogram
ft - Feet
in. - Inches
J* - Indicates an estimated concentration adjusted in accordance with Reference 28 (see Reference 27).

-Background samples - 1998 ESI Samples

Sample ID	Hazardous Substance	Concentration	SDL/CRDL/ SQL/CRQL	Reference(s)
MATRIX: Surface Soil				
RSDS-01-SS (0 to 3 in.)	**Inorganic Chemicals**			
	Barium	49 mg/kg	20 mg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 138; 25, p. 2; 68, p. 2; 69, pp. 3, 4
	Copper	6.1 J* mg/kg (5 J mg/kg)	2.5 mg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 138; 25, p. 2; 27, p. 4; 68, p. 2; 69, pp. 3, 4
	Lead	43 mg/kg	1 mg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 138; 25, p. 2; 68, p. 2; 69, pp. 3, 4
	Mercury	0.14 U mg/kg	0.1 mg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 138; 25, p. 2; 68, p. 2; 69, pp. 3, 4
	Zinc	20 U mg/kg	6 mg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 138; 25, p. 2; 68, p. 2; 69, pp. 3, 4
	Semivolatile Organic Compounds			
	Acenaphthene	450 U µg/kg	450 µg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 194; 68, p. 17; 70, pp. 1, 2
	Anthracene	450 U µg/kg	450 µg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 194; 68, p. 17; 70, pp. 1, 2
	Benzo(a) anthracene	450 U µg/kg	450 µg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 194; 68, p. 17; 70, pp. 1, 2
	Benzo(b and/or k)fluoranthene	450 U µg/kg	450 µg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 194; 68, p. 17; 70, pp. 1, 2
	Benzo(ghi) perylene	450 U µg/kg	450 µg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 194; 68, p. 17; 70, pp. 1, 2
	Benzo(a)pyrene	450 U µg/kg	450 µg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 194; 68, p. 17; 70, pp. 1, 2
	Carbazole	450 U µg/kg	450 µg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 194; 68, p. 17; 70, pp. 1, 2
	Chrysene	450 U µg/kg	450 µg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 194; 68, p. 17; 70, pp. 1, 2
	Dibenzo(a,h) anthracene	450 U µg/kg	450 µg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 194; 68, p. 17; 70, pp. 1, 2

Sample ID	Hazardous Substance	Concentration	SDL/CRDL/ SQL/CRQL	Reference(s)
RSDS-01-SS (0 to 3 in.) (Concluded)	Fluoranthene	450 U µg/kg	450 µg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 194; 68, p. 17; 70, pp. 1, 2
	Fluorene	450 U µg/kg	450 µg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 194; 68, p. 17; 70, pp. 1, 2
	Indeno(1,2,3-cd)pyrene	450 U µg/kg	450 µg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 194; 68, p. 17; 70, pp. 1, 2
	Phenanthrene	450 U µg/kg	450 µg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 194; 68, p. 17; 70, pp. 1, 2
	Pyrene	450 U µg/kg	450 µg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 194; 68, p. 17; 70, pp. 1, 2
MATRIX: Subsurface Soil				
RSDS-01-SB (3.5 to 4 ft)	**Inorganic Chemicals**			
	Arsenic	1.8 UJ mg/kg	1 mg/kg	7, pp. 12, 13; 9, pp. 10, 13, Appendix A - p. 147; 25, p. 2; 27, p. 3; 68, p. 3; 69, pp. 3, 4
	Chromium	3.1 mg/kg	1 mg/kg	7, pp. 12, 13; 9, pp. 10, 13, Appendix A - p. 147; 25, p. 2; 68, p. 3; 69, pp. 3, 4
	Cyanide	0.25 U mg/kg	2.5 mg/kg	7, pp. 12, 13; 9, pp. 10, 13, Appendix A - p. 147; 25, p. 2; 68, p. 3; 69, pp. 3, 4
	Lead	2.1 mg/kg	1 mg/kg	7, pp. 12, 13; 9, pp. 10, 13, Appendix A - p. 147; 25, p. 2; 68, p. 3; 69, pp. 3, 4
	Vanadium	9.51 J* mg/kg (7.1 J mg/kg)	5 mg/kg	7, pp. 12, 13; 9, pp. 10, 13, Appendix A - p. 147; 25, p. 2; 27, p. 3; 68, p. 3; 69, pp. 3, 4

Notes:

Adjustment of qualified source analytical data is not required, per Reference 28. However, since soil samples are being used to associate hazardous substances with on-site sources and are being compared to background sample concentrations, the adjustment makes the source evaluation conservative.

The original concentration for adjusted J-qualified (estimated) analytical results is presented in parentheses.

CRDLS - Contract Required Detection Limit
SDL - Sample Detection Limit
CRQL - Contract Required Quantitation Limit
SS - Surface soil
mg/kg - Milligrams per kilogram
ft - Feet
in. - Inches
J* - Indicates an estimated concentration adjusted in accordance with Reference 28 (See Reference 27).
SQL - Sample Quantitation Limit
RSDS - Raleigh Street Dump Site
SB - Subsurface soil
µg/kg - Micrograms per kilogram

U - Indicates the compound/substance was analyzed for, but not detected. The associated numerical value is the SQL or SDL.

2001 Phase 1 RI Samples

In March 2001, on behalf of EPA, CDM collected a total of 39 surface soil (including three duplicates) and 26 subsurface soil samples from 13 test pits (PIT01 through PIT10, PIT12, PIT13, and PIT14) and 20 soil borings on RSD during Phase 1 RI sampling activities (see Figure 4) (Ref. 16, pp. 17-19, 113-120, 180-216, 378-417; 955-974). The test pits were excavated primarily north of Raleigh Street and its extension (Ref. 16, pp. 51, 91). Fill materials were encountered in 10 of the 13 test pits (Ref. 16, pp. 51, 113-120). The thickness of the landfilled material ranges in depth from 1 to 7 feet, and the ground surface at every test pit location was littered with broken battery casings, construction debris, and/or trash (Ref. 16, pp. 51, 113-120).

Due to the random nature of dumping and the reported movement and spreading of the waste materials by a bull dozer, soil samples collected from the dumping area are considered representative of the wastes disposed in the dump source. Therefore, the analytical results of soil samples collected from within the dump area are used to characterize this source.

No soil samples collected during the Phase 1 RI sampling activities were collected specifically to represent background levels; the RI used the 1998 ESI background soil samples for comparison to the Phase 1 RI soil samples (Ref. 29, p. 1). However, for the purposes of this HRS documentation record, the concentrations of hazardous substances detected in the Phase 1 RI soil samples were compared to samples collected during the Phase 1 RI sampling, instead of the earlier ESI background soil samples. This was done in order to establish more similarity (e.g., sample depth, collection method, timing, etc.) between the background samples and the samples collected from the suspected source area.

For the Phase I RI sampling, in order to account for the range of naturally occurring substances, particularly metals, surface and subsurface soil samples collected from multiple locations were chosen to represent background levels. These locations included test pit six (PIT06), soil boring SS04P1, and soil boring SS09P1/SB09. Test pit six was excavated in the northeast corner of RSD, east of the birdfoot drainage canals. One surface soil sample was collected from test pit six from a depth of 0.5 ft, and one subsurface soil sample was collected from test pit six from a depth of 3 ft (Ref. 16, pp. 113-120, 378-417). Of all the test pits excavated, test pit six was located the furthest upgradient and away from the dump source (Ref. 16, pp. 84, 85, 91, 94). In addition, no discarded battery casings and/or landfilled waste materials were observed at the location of test pit six (Ref. 16, p. 116).

Soil boring SS04P1 was located in the vicinity of the eastern power line easement, east of RSD and upgradient of the dump source (Ref. 16, pp. 91, 389, 390). One surface soil sample was collected from soil boring SS04P1 from a depth of 0.5 ft; no subsurface soil sample was collected from SS04P1 (Ref. 16, pp. 91, 389, 390). Soil boring SS09P1/SB09 was located north of the dump source, east of the birdfoot drainage canals (Ref. pp. 91, 410). One surface soil sample and one subsurface soil sample were collected from soil boring SS09P1/SB09 from depths of 0.5 ft and 3 ft, respectively (Ref. pp. 91, 410). The background soil borings were located outside the test pit area in which discarded battery casings and/or landfilled waste materials were observed (see Figure 4) (Ref. 16, pp. 113-120, 389, 390, 410).

All surface soil samples were collected from 0 to 0.5 foot below grade during the Phase 1 RI field investigation (Ref. 16, pp. 18, 378-417). In regards to subsurface soil samples, they were collected at depths ranging from 2 to 10 feet below grade (Ref. 16, pp. 19, 114-120, 378-417). Several subsurface soil samples collected during the Phase 1 RI were reported to have been collected from a depth of 2 feet (Ref. 16, pp. 114-120, 378-417). However, no range of sample depths was provided for these subsurface soil samples (Ref. 16, pp. 114-120, 378-417). All soil samples reported to have been collected from a depth of 2 feet or greater are evaluated as subsurface soil samples

in this HRS documentation record. Sample collection depths are presented in parentheses in the analytical data table below.

For some of the Phase 1 RI soil samples, variations in the sample identification/location numbers presented in Reference 16 exist . For example, soil sample SS01P1 is presented as such on the sample location figures and in the data summary tables (Appendix D) of Reference 16 (Ref. 16, pp. 91, 182, 192). However, on the chain-of-custody (COC) records and laboratory analytical data sheets presented in Appendix H of Reference 16, the sample identification is listed as SS01 or SS-01(Ref. 16, pp. 887, 955, 956). Furthermore, for duplicate samples collected during the Phase 1 RI, additional variations in sample identification numbers exists. For example, a duplicate surface soil sample was collected from test pit 14 (PIT14) (Ref. 16, pp. 70, 91, 120, 182, 192, 403). In the field log notes and in the test pit logs, the duplicate sample is listed as RSDS24-TPSS (Ref. 16, pp. 70, 120, 403). However, on the COC, the sample is listed as TEST PIT 24, and on the laboratory analytical data sheets the sample is listed as PIT24 (Ref. 16, pp. 921, 963).

Soil samples collected from test pits primarily consisted of yellowish brown, fine silty sand. A few contained olive grey to black, fine silty sand. In addition, almost all the soil samples collected from the test pits contained some organic material (e.g., roots) and/or minor amounts of waste materials (Ref. 16, pp. 113-120, 378-417). In general, subsurface soil samples collected from test pits consisted of yellowish brown or light olive grey fine to very fine silty sand and sandy clay. Some of the subsurface soil samples also contained organic material (e.g., roots) and/or waste materials (Ref. 16, pp. 113-120, 378-417). Soil samples collected from soil borings generally consisted of yellowish brown and/or olive grey, very fine to fine silty sand with some organic material and occasional waste materials (Ref. 16, pp. 378-417). The background soil samples and the soil samples from the source area were collected from similar depths, employed the same sampling method, and consisted of similar soil types (Ref. 16. pp. 41, 42, 113-120, 378-417, 538-953).

The table below contains elevated concentrations of hazardous substances detected in soil samples collected from test pits excavated north of Raleigh Street containing fill material at depth and/or broken battery casings excavated north of Raleigh Street and its extension. Also, soil samples collected from soil borings advanced within the area of the test pits in which fill materials/broken battery casings were encountered are included in the table below (see Figure 4) (Ref. 16, pp. 51, 91, 94, 113-120, 180-216).

All soil samples collected during the Phase 1 RI were analyzed by an EPA CLP laboratory; analytical data sheets are provided in Reference 16, pp. 538-953. All data validation was conducted by EPA Region 4 SESD (Refs. 16, pp. 41, 42; 71; 72). The CRDLs are provided in lieu of SDLs for inorganic substances. The CRDLs are listed in Reference 25 (Ref. 25, p. 2). For organic substances, the CRQL is used instead of the SQL for samples in which the SQL is not apparent from the sample data (Ref. 26, p. 2).

Because sufficient non-qualified data are available, Phase 1 RI analytical results that were estimated (J-qualified) are not included in this HRS documentation record (Refs. 71; 72).

Hazardous Substance	Evidence			SDL/CRDL/ SQL/CRQL	Reference(s)
MATRIX: Test Pits - Surface Soil					
Metals					
Barium	PIT04 (0.5 ft)	680	mg/kg	20 mg/kg	16, pp. 91, 94, 378-417, 886-921, 955-974; 25, p. 2; 71
	PIT05 (0.5 ft)	700	mg/kg		
Cadmium	PIT03 (0.5 ft)	1.4	mg/kg	0.5 mg/kg	16, pp. 91, 94, 378-417, 886-921, 937, 955-974; 25, p. 2; 71
	PIT04 (0.5 ft)	1.9	mg/kg		
	PIT05 (0.5 ft)	1.4	mg/kg		
	PIT08 (0.5 ft)	1.4	mg/kg		
	PIT09 (0.5 ft)	1.7	mg/kg		
	PIT10 (0.5 ft)	1.1	mg/kg		
	PIT12 (0.5 ft)	2.6	mg/kg		
	PIT13 (0.5 ft)	2.0	mg/kg		
	PIT14 (0.5 ft)	1.9	mg/kg		
	PIT24 (0.5 ft) (Dup. of PIT14)	1.4	mg/kg		
Copper	PIT03 (0.5 ft)	45	mg/kg	2.5 mg/kg	16, pp. 91, 94, 378-417, 886-921, 937, 955-974; 25, p. 2; 71
	PIT04 (0.5 ft)	38	mg/kg		
	PIT05 (0.5 ft)	50	mg/kg		
	PIT08 (0.5 ft)	23	mg/kg		
	PIT09 (0.5 ft)	25	mg/kg		
	PIT10 (0.5 ft)	17	mg/kg		
	PIT12 (0.5 ft)	75	mg/kg		
	PIT13 (0.5 ft)	49	mg/kg		
	PIT14 (0.5 ft)	24	mg/kg		
	PIT24 (0.5 ft) (Dup. of PIT14)	25	mg/kg		
Lead	PIT03 (0.5 ft)	680	mg/kg	1 mg/kg	16, pp. 91, 94, 378-417, 886-921, 937, 955-974; 25, p. 2; 71
	PIT04 (0.5 ft)	850	mg/kg		
	PIT05 (0.5 ft)	1,500	mg/kg		
	PIT08 (0.5 ft)	640	mg/kg		
	PIT09 (0.5 ft)	590	mg/kg		
	PIT12 (0.5 ft)	1,800	mg/kg		
	PIT13 (0.5 ft)	730	mg/kg		
	PIT14 (0.5 ft)	480	mg/kg		
	PIT24 (0.5 ft) (Dup. of PIT14)	530	mg/kg		
Manganese	PIT03 (0.5 ft)	80	mg/kg	1.5 mg/kg	16, pp. 91, 94, 378-417, 886-921, 937, 955-974; 25, p. 2; 71
	PIT04 (0.5 ft)	160	mg/kg		
	PIT05 (0.5 ft)	240	mg/kg		
	PIT08 (0.5 ft)	68	mg/kg		
	PIT09 (0.5 ft)	100	mg/kg		
	PIT10 (0.5 ft)	42	mg/kg		

Hazardous Substance	Evidence			SDL/CRDL/ SQL/CRQL	Reference(s)
Manganese	PIT12 (0.5 ft)	140	mg/kg		
	PIT13 (0.5 ft)	79	mg/kg		
	PIT14 (0.5 ft)	67	mg/kg		
	PIT24 (0.5 ft) (Dup. of PIT14)	65	mg/kg		
Mercury	PIT04 (0.5 ft)	1.1	mg/kg	0.1 mg/kg	16, pp. 91, 94, 378-417, 886-921, 955-974; 25, p. 2; 71
	PIT05 (0.5 ft)	2.1	mg/kg		
	PIT12 (0.5 ft)	0.53	mg/kg		
Vanadium	PIT08 (0.5 ft)	25	mg/kg	5 mg/kg	16, pp. 91, 94, 378-417, 886-921, 937, 955-974; 25, p. 2; 71
Zinc	PIT03 (0.5 ft)	690	mg/kg	6 mg/kg	16, pp. 91, 94, 378-417, 886-921, 955-974; 25, p. 2; 71
	PIT04 (0.5 ft)	1,100	mg/kg		
	PIT05 (0.5 ft)	1,600	mg/kg		
	PIT08 (0.5 ft)	830	mg/kg		
	PIT09 (0.5 ft)	1,900	mg/kg		
	PIT10 (0.5 ft)	430	mg/kg		
	PIT12 (0.5 ft)	1,500	mg/kg		
	PIT13 (0.5 ft)	1,00	mg/kg		
	PIT14 (0.5 ft)	1,000	mg/kg		
	PIT24 (0.5 ft) (Dup. of PIT14)	860	mg/kg		
Semivolatile Organic Compounds					
Acenaphthylene	PIT14 (0.5 ft)	530	µg/kg	380 µg/kg	16, pp. 91, 94, 378-417, 620, 622, 955-974; 72
	PIT24 (0.5 ft) (Dup. of PIT14)	690	µg/kg	390 µg/kg	
Anthracene	PIT04 (0.5 ft)	3,800	µg/kg	1,100 µg/kg	16, pp. 91, 94, 378-417, 600, 612, 620, 622, 955-974; 72
	PIT09 (0.5 ft)	3,300	µg/kg	3,000 µg/kg	
	PIT14 (0.5 ft)	1,600	µg/kg	380 µg/kg	
	PIT24 (0.5 ft) (Dup. of PIT14)	1,600	µg/kg	390 µg/kg	
Benzaldehyde	PIT24 (0.5 ft) (Dup. of PIT14)	960	µg/kg	390 µg/kg	16, pp. 91, 94, 378-417, 622, 955-974; 72
Benzo(a)anthracene	PIT03 (0.5 ft)	16,000	µg/kg	6,100 µg/kg	16, pp. 91, 94, 378-417, 598, 600, 602, 612, 616, 618, 620, 622, 955-974; 72
	PIT04 (0.5 ft)	8,700	µg/kg	1,100 µg/kg	
	PIT05 (0.5 ft)	3,300	µg/kg	1,600 µg/kg	
	PIT09 (0.5 ft)	10,000	µg/kg	3,000 µg/kg	
	PIT12 (0.5 ft)	640	µg/kg	410 µg/kg	
	PIT13 (0.5 ft)	870	µg/kg	360 µg/kg	
	PIT14 (0.5 ft)	6,100	µg/kg	380 µg/kg	
	PIT24 (0.5 ft) (Dup. of PIT14)	5,200	µg/kg	390 µg/kg	

Hazardous Substance	Evidence			SDL/CRDL/ SQL/CRQL	Reference(s)
Benzo(b) fluoranthene	PIT03 (0.5 ft)	17,000	µg/kg	6,100 µg/kg	16, pp. 91, 94, 378-417, 598, 600, 602, 612, 616, 618, 620, 622, 955-974; 72
	PIT04 (0.5 ft)	6,600	µg/kg	1,100 µg/kg	
	PIT05 (0.5 ft)	3,600	µg/kg	1,600 µg/kg	
	PIT09 (0.5 ft)	9,000	µg/kg	3,000 µg/kg	
	PIT12 (0.5 ft)	640	µg/kg	410 µg/kg	
	PIT13 (0.5 ft)	730	µg/kg	360 µg/kg	
	PIT14 (0.5 ft)	5,100	µg/kg	380 µg/kg	
	PIT24 (0.5 ft) (Dup. of PIT14)	4,100	µg/kg	390 µg/kg	
Benzo(ghi)perylene	PIT03 (0.5 ft)	7,000	µg/kg	6,100 µg/kg	16, pp. 91, 94, 378-417, 598, 600, 612, 616, 620, 622, 955-974; 72
	PIT04 (0.5 ft)	2,400	µg/kg	1,100 µg/kg	
	PIT09 (0.5 ft)	4,500	µg/kg	3,000 µg/kg	
	PIT13 (0.5 ft)	560	µg/kg	360 µg/kg	
	PIT14 (0.5 ft)	2,400	µg/kg	380 µg/kg	
	PIT24 (0.5 ft) (Dup. of PIT14)	2,100	µg/kg	390 µg/kg	
Benzo(k) fluoranthene	PIT03 (0.5 ft)	12,000	µg/kg	6,100 µg/kg	16, pp. 91, 94, 378-417, 598, 600, 602, 612, 616, 618, 620, 622, 955-974; 72
	PIT04 (0.5 ft)	7,100	µg/kg	1,100 µg/kg	
	PIT05 (0.5 ft)	3,000	µg/kg	1,600 µg/kg	
	PIT09 (0.5 ft)	8,200	µg/kg	3,000 µg/kg	
	PIT12 (0.5 ft)	600	µg/kg	410 µg/kg	
	PIT13 (0.5 ft)	890	µg/kg	360 µg/kg	
	PIT14 (0.5 ft)	4,600	µg/kg	380 µg/kg	
	PIT24 (0.5 ft) (Dup. of PIT14)	4,400	µg/kg	390 µg/kg	
Benzo(a)pyrene	PIT03 (0.5 ft)	14,000	µg/kg	6,100 µg/kg	16, pp. 91, 94, 378-417, 598, 600, 602, 612, 616, 618, 620, 622, 955-974; 72
	PIT04 (0.5 ft)	7,600	µg/kg	1,100 µg/kg	
	PIT05 (0.5 ft)	3,200	µg/kg	1,600 µg/kg	
	PIT09 (0.5 ft)	8,900	µg/kg	3,000 µg/kg	
	PIT12 (0.5 ft)	580	µg/kg	410 µg/kg	
	PIT13 (0.5 ft)	810	µg/kg	360 µg/kg	
	PIT14 (0.5 ft)	4,900	µg/kg	380 µg/kg	
	PIT24 (0.5 ft) (Dup. of PIT14)	4,100	µg/kg	390 µg/kg	
Butylbenzyl-phthalate	PIT13 (0.5 ft)	570	µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 618, 955-974; 72
Bis(2-ethylhexyl) phthalate	PIT14 (0.5 ft)	780	µg/kg	380 µg/kg	16, pp. 91, 94, 378-417, 620, 622, 955-974; 72
	PIT24 (0.5 ft) (Dup. of PIT14)	4,100	µg/kg	390 µg/kg	
Carbazole	PIT04 (0.5 ft)	2,200	µg/kg	1,100 µg/kg	16, pp. 91, 94, 378-417, 600, 955-974; 72

Hazardous Substance	Evidence			SDL/CRDL/ SQL/CRQL	Reference(s)
Chrysene	PIT03 (0.5 ft)	17,000	µg/kg	6,100 µg/kg	16, pp. 91, 94, 378-417, 598, 600, 602, 612, 616, 618, 620, 622, 955-974; 72
	PIT04 (0.5 ft)	8,600	µg/kg	1,100 µg/kg	
	PIT05 (0.5 ft)	3,500	µg/kg	1,600 µg/kg	
	PIT09 (0.5 ft)	11,000	µg/kg	3,000 µg/kg	
	PIT12 (0.5 ft)	750	µg/kg	410 µg/kg	
	PIT13 (0.5 ft)	940	µg/kg	360 µg/kg	
	PIT14 (0.5 ft)	6,400	µg/kg	380 µg/kg	
	PIT24 (0.5 ft) (Dup. of PIT14)	6,000	µg/kg	390 µg/kg	
Dibenzo(a,h) anthracene	PIT04 (0.5 ft)	1,600	µg/kg	1,100 µg/kg	16, pp. 91, 94, 378-417, 600, 620, 622, 955-974; 72
	PIT14 (0.5 ft)	1,600	µg/kg	380 µg/kg	
	PIT24 (0.5 ft) (Dup. of PIT14)	1,400	µg/kg	390 µg/kg	
Fluoranthene	PIT03 (0.5 ft)	36,000	µg/kg	6,100 µg/kg	16, pp. 91, 94, 378-417, 598, 600, 602, 612, 616, 618, 620, 622, 955-974; 72
	PIT04 (0.5 ft)	21,000	µg/kg	1,100 µg/kg	
	PIT05 (0.5 ft)	5,800	µg/kg	1,600 µg/kg	
	PIT09 (0.5 ft)	18,000	µg/kg	3,000 µg/kg	
	PIT12 (0.5 ft)	1,300	µg/kg	410 µg/kg	
	PIT13 (0.5 ft)	1,700	µg/kg	360 µg/kg	
	PIT14 (0.5 ft)	10,000	µg/kg	380 µg/kg	
	PIT24 (0.5 ft) (Dup. of PIT14)	9,300	µg/kg	390 µg/kg	
Indeno(1,2,3-cd) pyrene	PIT03 (0.5 ft)	9,400	µg/kg	6,100 µg/kg	16, pp. 91, 94, 378-417, 598, 600, 602, 612, 616, 618, 620, 622, 955-974; 72
	PIT04 (0.5 ft)	3,400	µg/kg	1,100 µg/kg	
	PIT05 (0.5 ft)	1,600	µg/kg	1,600 µg/kg	
	PIT09 (0.5 ft)	5,500	µg/kg	3,000 µg/kg	
	PIT13 (0.5 ft)	550	µg/kg	360 µg/kg	
	PIT14 (0.5 ft)	3,300	µg/kg	380 µg/kg	
	PIT24 (0.5 ft) (Dup. of PIT14)	2,900	µg/kg	390 µg/kg	
Pentachlorophenol	PIT08 (0.5 ft)	54,000	µg/kg	30,000 µg/kg	16, pp. 91, 94, 378-417, 610; 72
Phenanthrene	PIT03 (0.5 ft)	24,000	µg/kg	6,100 µg/kg	16, pp. 91, 94, 378-417, 598, 600, 602, 612, 614, 616, 618, 620, 622, 955-974; 72
	PIT04 (0.5 ft)	12,000	µg/kg	1,100 µg/kg	
	PIT05 (0.5 ft)	2,200	µg/kg	1,600 µg/kg	
	PIT09 (0.5 ft)	11,000	µg/kg	3,000 µg/kg	
	PIT12 (0.5 ft)	780	µg/kg	410 µg/kg	
	PIT13 (0.5 ft)	1,000	µg/kg	360 µg/kg	
	PIT14 (0.5 ft)	5,100	µg/kg	380 µg/kg	
	PIT24 (0.5 ft) (Dup. of PIT14)	6,600	µg/kg	390 µg/kg	

Hazardous Substance	Evidence			SDL/CRDL/ SQL/CRQL	Reference(s)
Pyrene	PIT03 (0.5 ft)	27,000	µg/kg	6,100 µg/kg	16, pp. 91, 94, 378-417, 598, 600, 602, 612, 614, 616, 618, 620, 622, 955-974; 72
	PIT04 (0.5 ft)	14,000	µg/kg	1,100 µg/kg	
	PIT05 (0.5 ft)	4,900	µg/kg	1,600 µg/kg	
	PIT09 (0.5 ft)	17,000	µg/kg	3,000 µg/kg	
	PIT10 (0.5 ft)	580	µg/kg	360 µg/kg	
	PIT12 (0.5 ft)	1,200	µg/kg	410 µg/kg	
	PIT13 (0.5 ft)	1,600	µg/kg	360 µg/kg	
	PIT14 (0.5 ft)	8,800	µg/kg	380 µg/kg	
	PIT24 (0.5 ft) (Dup. of PIT14)	9,000	µg/kg	390 µg/kg	
MATRIX: Test Pits - Subsurface Soil					
Metals					
Cadmium	PIT10 (2 ft)	1.4	mg/kg	0.5 mg/kg	16, pp. 91, 94, 378-417, 942, 946, 955-974; 25, p. 2; 71
	PIT14 (2 ft)	0.99	mg/kg		
Copper	PIT05 (2 ft)	4.2	mg/kg	2.5 mg/kg	16, pp. 91, 94, 378-417, 934, 942, 943, 946, 955-974; 25, p. 2; 71
	PIT10 (2 ft)	37	mg/kg		
	PIT10 (4 ft)	4.9	mg/kg		
	PIT24 (0.5 ft) (Dup. of PIT14)	39	mg/kg		
Lead	~~PIT03 (2 ft)~~	~~22~~	~~mg/kg~~	1 mg/kg	16, pp. 91, 94, 378-417, 934, 942, 943, 946, 955-974; 25, p. 2; 71
	PIT05 (2 ft)	86	mg/kg		
	PIT10 (2 ft)	1,700	mg/kg		
	PIT10 (4 ft)	25	mg/kg		
	PIT24 (0.5 ft) (Dup. of PIT14)	180	mg/kg		
Manganese	PIT10 (2 ft)	120	mg/kg	1.5 mg/kg	16, pp. 91, 94, 378-417, 942, 946, 955-974; 25, p. 2; 71
	PIT14 (2 ft)	120	mg/kg		
Zinc	PIT05 (2 ft)	200	mg/kg	6 mg/kg	16, pp. 91, 94, 378-417, 928, 934, 942, 946, 955-974; 25, p. 2; 71
	PIT10 (2 ft)	1,400	mg/kg		
	PIT14 (2 ft)	840	mg/kg		
Semivolatile Organic Compounds					
Benzo(a)anthracene	PIT10 (2 ft)	1,100	µg/kg	420 µg/kg	16, pp. 91, 94, 378-417, 663; 72
Benzo(b) fluoranthene	PIT10 (2 ft)	1,400	µg/kg	420 µg/kg	16, pp. 91, 94, 378-417, 663; 72
Benzo(ghi)perylene	PIT10 (2 ft)	660	µg/kg	420 µg/kg	16, pp. 91, 94, 378-417, 663; 72
Benzo(k) fluoranthene	PIT10 (2 ft)	1,000	µg/kg	420 µg/kg	16, pp. 91, 94, 378-417, 663; 72
Benzo(a)pyrene	PIT10 (2 ft)	1,100	µg/kg	420 µg/kg	16, pp. 91, 94, 378-417, 663; 72

Hazardous Substance	Evidence			SDL/CRDL/ SQL/CRQL	Reference(s)
Bis(2-ethylhexyl) phthalate	PIT10 (2 ft)	1,400	µg/kg	420 µg/kg	16, pp. 91, 94, 378-417, 663; 72
Chrysene	PIT10 (2 ft)	1,400	µg/kg	420 µg/kg	16, pp. 91, 94, 378-417, 663; 72
Fluoranthene	PIT10 (2 ft)	2,300	µg/kg	420 µg/kg	16, pp. 91, 94, 378-417, 663; 72
Indeno(1,2,3-cd) pyrene	PIT10 (2 ft)	780	µg/kg	420 µg/kg	16, pp. 91, 94, 378-417, 663; 72
Phenanthrene	PIT10 (2 ft)	1,100	µg/kg	420 µg/kg	16, pp. 91, 94, 378-417, 663; 72
Pyrene	PIT10 (2 ft)	2,500	µg/kg	420 µg/kg	16, pp. 91, 94, 378-417, 663; 72
MATRIX: Soil Borings - Surface Soil					
Metals					
Barium	SS03P1 (0.5 ft)	170	mg/kg	20 mg/kg	16, pp. 91, 94, 378-417, 889, 955-974; 25, p. 2; 71
Cadmium	SS03P1 (0.5 ft)	0.55	mg/kg	0.5 mg/kg	16, pp. 91, 94, 378-417, 889, 892-894, 955-974; 25, p. 2; 71
	SS06P1 (0.5 ft)	1.6	mg/kg		
	SS07P1 (0.5 ft)	2.8	mg/kg		
	SS08P1 (0.5 ft)	1.8	mg/kg		
Copper	SS03P1 (0.5 ft)	19	mg/kg	2.5 mg/kg	16, pp. 91, 94, 378-417,889, 892-894, 955-974; 25, p. 2; 71
	SS06P1 (0.5 ft)	43	mg/kg		
	SS07P1 (0.5 ft)	28	mg/kg		
	SS08P1 (0.5 ft)	36	mg/kg		
Lead	SS03P1 (0.5 ft)	350	mg/kg	1 mg/kg	16, pp. 91, 94, 378-417, 889, 892-894, 955-974; 25, p. 2; 71
	SS06P1 (0.5 ft)	620	mg/kg		
	SS07P1 (0.5 ft)	960	mg/kg		
	SS08P1 (0.5 ft)	400	mg/kg		
Manganese	SS03P1 (0.5 ft)	36	mg/kg	1.5 mg/kg	16, pp. 91, 94, 378-417, 889, 892-894, 955-974; 25, p. 2; 71
	SS06P1 (0.5 ft)	89	mg/kg		
	SS07P1 (0.5 ft)	68	mg/kg		
	SS08P1 (0.5 ft)	47	mg/kg		
Zinc	SS03P1 (0.5 ft)	330	mg/kg	6 mg/kg	16, pp. 91, 94, 378-417, 889, 892-894, 955-974; 25, p. 2; 71
	SS06P1 (0.5 ft)	850	mg/kg		
	SS07P1 (0.5 ft)	690	mg/kg		
	SS08P1 (0.5 ft)	110	mg/kg		
Semivolatile Organic Compounds					
Acenaphthene	SS03P1 (0.5 ft)	760	µg/kg	410 µg/kg	16, pp. 91, 94, 378-417, 558, 955; 72
Anthracene	SS03P1 (0.5 ft)	2,500	µg/kg	410 µg/kg	16, pp. 91, 94, 378-417, 558, 955; 72

Hazardous Substance	Evidence			SDL/CRDL/ SQL/CRQL	Reference(s)
Benzo(a)anthracene	SS03P1 (0.5 ft)	8,100	µg/kg	410 µg/kg	16, pp. 91, 94, 378-417, 558, 955; 72
Benzo(b) fluoranthene	SS03P1 (0.5 ft)	8,300	µg/kg	410 µg/kg	16, pp. 91, 94, 378-417, 558, 955; 72
Benzo(ghi)perylene	SS03P1 (0.5 ft)	2,300	µg/kg	410 µg/kg	16, pp. 91, 94, 378-417, 558, 955; 72
Benzo(k) fluoranthene	SS03P1 (0.5 ft)	6,200	µg/kg	410 µg/kg	16, pp. 91, 94, 378-417, 558, 955; 72
Benzo(a)pyrene	SS03P1 (0.5 ft)	7,500	µg/kg	410 µg/kg	16, pp. 91, 94, 378-417, 558, 955; 72
Carbazole	SS03P1 (0.5 ft)	1,800	µg/kg	410 µg/kg	16, pp. 91, 94, 378-417, 558, 955; 72
Chrysene	SS03P1 (0.5 ft)	8,400	µg/kg	410 µg/kg	16, pp. 91, 94, 378-417, 558, 955; 72
Dibenzo(a,h) anthracene	SS03P1 (0.5 ft)	1,600	µg/kg	410 µg/kg	16, pp. 91, 94, 378-417, 558, 955; 72
Fluoranthene	SS03P1 (0.5 ft) SS07P1 (0.5 ft)	18,000 680	µg/kg µg/kg	410 µg/kg 350 µg/kg	16, pp. 91, 94, 378-417, 558, 564, 606, 955, 957; 72
Fluorene	SS03P1 (0.5 ft)	700	µg/kg	410 µg/kg	16, pp. 91, 94, 378-417, 558, 955; 72
Indeno(1,2,3-cd) pyrene	SS03P1 (0.5 ft)	5,200	µg/kg	410 µg/kg	16, pp. 91, 94, 378-417, 558, 955; 72
Phenanthrene	SS03P1 (0.5 ft) SS07P1 (0.5 ft)	7,800 440	µg/kg µg/kg	410 µg/kg 350 µg/kg	16, pp. 91, 94, 378-417, 558, 564, 957, 957; 72
Pyrene	SS03P1 (0.5 ft) SS07P1 (0.5 ft)	13,000 640	µg/kg µg/kg	410 µg/kg 350 µg/kg	16, pp. 91, 94, 378-417, 558, 564, 606, 955, 957; 72

Notes:

CRDLS - Contract Required Detection Limit
SDL - Sample Detection Limit
SQL - Sample Quantitation Limit
CRQL - Contract Required Quantitation Limit
ft - feet
SS - Surface soil
P1 - Phase 1
PIT - Test pit
mg/kg - Milligrams per kilogram
µg/kg - Micrograms per kilogram
Dup. - Duplicate

-Background samples - 2001 Phase 1 RI Samples

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/CRQL	Reference(s)
MATRIX: Surface Soil				
PIT06 (0.5 ft)	**Metals**			
	Barium	ND (3.8 mg/kg)	20 mg/kg	16, pp. 91, 94, 378-417, 913, 958; 25, p. 2; 71
	Cadmium	0.13 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 378-417, 913, 958; 25, p. 2; 71
	Copper	ND (1.1 mg/kg)	2.5 mg/kg	16, pp. 91, 94, 378-417, 913, 958; 25, p. 2; 71
	Lead	58 mg/kg	1 mg/kg	16, pp. 91, 94, 378-417, 913, 958; 25, p. 2; 71
	Manganese	2.3 U mg/kg	1.5 mg/kg	16, pp. 91, 94, 378-417, 913, 958; 25, p. 2; 71
	Mercury	0.05 U mg/kg	0.1 mg/kg	16, pp. 91, 94, 378-417, 913, 958; 25, p. 2; 71
	Vanadium	ND (1.2 mg/kg)	5 mg/kg	16, pp. 91, 94, 378-417, 913, 958; 25, p. 2; 71
	Zinc	26 mg/kg	6 mg/kg	16, pp. 91, 94, 378-417, 913, 958; 25, p. 2; 71
	Semivolatile Organic Compounds			
	Acenaphthylene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Acenaphthylene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Anthracene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Benzaldehyde	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Benzo(a)anthracene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Benzo(b)fluoranthene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Benzo(ghi)perylene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Benzo(k)fluoranthene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Benzo(a)pyrene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Butylbenzylphthalate	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/CRQL	Reference(s)
PIT06 (0.5 ft) (Concluded)	Bis(2-ethylhexyl) phthalate	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Carbazole	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Chrysene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Dibenzo(a,h) anthracene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Fluoranthene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Fluorene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Indeno(1,2,3-cd) pyrene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Pentachlorophenol	910 U µg/kg	910 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Phenanthrene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Pyrene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
SS04P1 (0.5 ft)	**Metals**			
	Barium	ND (2.9 mg/kg)	20 mg/kg	16, pp. 91, 94, 389, 390, 890, 958; 25, p. 2; 71
	Cadmium	0.13 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 389, 390, 890, 958; 25, p. 2; 71
	Copper	ND (0.78 mg/kg)	2.5 mg/kg	16, pp. 91, 94, 389, 390, 890, 958; 25, p. 2; 71
	Lead	24 mg/kg	1 mg/kg	16, pp. 91, 94, 389, 390, 890, 958; 25, p. 2; 71
	Manganese	0.71 U mg/kg	1.5 mg/kg	16, pp. 91, 94, 389, 390, 890, 958; 25, p. 2; 71
	Mercury	0.05 U mg/kg	0.1 mg/kg	16, pp. 91, 94, 389, 390, 890, 958; 25, p. 2; 71
	Vanadium	ND (2.9 mg/kg)	5 mg/kg	16, pp. 91, 94, 389, 390, 890, 958; 25, p. 2; 71
	Zinc	ND (4.4 mg/kg)	6 mg/kg	16, pp. 91, 94, 389, 390, 890, 958; 25, p. 2; 71

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/CRQL	Reference(s)
SS04P1 (0.5 ft) (Continued)	**Semivolatile Organic Compounds**			
	Acenaphthene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560, 961; 72
	Acenaphthylene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560, 961; 72
	Anthracene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560, 961; 72
	Benzaldehyde	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560, 961; 72
	Benzo(a)anthracene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560, 961; 72
	Benzo(b)fluoranthene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560, 961; 72
	Benzo(ghi)perylene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560, 961; 72
	Benzo(k)fluoranthene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560, 961; 72
	Benzo(a)pyrene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560, 961; 72
	Bis(2-ethylhexyl) phthalate	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560, 961; 72
	Butylbenzylphthalate	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560, 961; 72
	Carbazole	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560, 961; 72
	Chrysene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560, 961; 72
	Dibenzo(a,h) anthracene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560, 961; 72
	Fluoranthene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560, 961; 72
	Fluorene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560, 961; 72
	Indeno(1,2,3-cd) pyrene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560, 961; 72

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/CRQL	Reference(s)
SS04P1 (0.5 ft) (Concluded)	Pentachlorophenol	930 U µg/kg	930 µg/kg	16, pp. 91, 94, 389, 390, 560, 961; 72
	Phenanthrene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560, 961; 72
	Pyrene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560, 961; 72
SS09P1 (0.5 ft)	**Metals**			
	Barium	--* mg/kg	20 mg/kg	16, pp. 91, 94, 410, 895, 971; 25, p. 2; 71
	Cadmium	0.18 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 410, 895, 971; 25, p. 2; 71
	Copper	2.9 U mg/kg	2.5 mg/kg	16, pp. 91, 94, 410, 895, 971; 25, p. 2; 71
	Lead	58 mg/kg	1 mg/kg	16, pp. 91, 94, 410, 895, 971; 25, p. 2; 71
	Manganese	4.3 U mg/kg	1.5 mg/kg	16, pp. 91, 94, 410, 895, 971; 25, p. 2; 71
	Mercury	0.11 U mg/kg	0.1 mg/kg	16, pp. 91, 94, 410, 895, 971; 25, p. 2; 71
	Vanadium	5.4 mg/kg	5 mg/kg	16, pp. 91, 94, 410, 895, 971; 25, p. 2; 71
	Zinc	8.5 mg/kg	6 mg/kg	16, pp. 91, 94, 410, 895, 971; 25, p. 2; 71
	Semivolatile Organic Compounds			
	Acenaphthene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 970; 72
	Acenaphthylene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 970; 72
	Anthracene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 970; 72
	Benzaldehyde	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 970; 72
	Benzo(a)anthracene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 970; 72
	Benzo(b)fluoranthene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 970; 72
	Benzo(ghi)perylene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 970; 72
	Benzo(k)fluoranthene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 970; 72

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/CRQL	Reference(s)
SS09P1 (0.5 ft) (Continued)	Benzo(a)pyrene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 970; 72
	Bis(2-ethylhexyl) phthalate	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 970; 72
	Butylbenzylphthalate	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 970; 72
	Carbazole	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 970; 72
	Chrysene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 970; 72
	Dibenzo(a,h) anthracene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 970; 72
	Fluoranthene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 970; 72
	Fluorene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 970; 72
	Indeno(1,2,3-cd) pyrene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 970; 72
	Pentachlorophenol	1,400 U µg/kg	1,400 µg/kg	16, pp. 91, 94, 410, 568, 970; 72
	Phenanthrene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 970; 72
	Pyrene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 970; 72
MATRIX: Subsurface Soil				
PIT06 (3 ft)	**Metals**			
	Cadmium	0.14 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 378-417, 936, 958; 25, p. 2; 71
	Copper	0.17 U mg/kg	2.5 mg/kg	16, pp. 91, 94, 378-417, 936, 958; 25, p. 2; 71
	Lead	5.4 mg/kg	1 mg/kg	16, pp. 91, 94, 378-417, 936, 958; 25, p. 2; 71
	Manganese	4.0 mg/kg	1.5 mg/kg	16, pp. 91, 94, 378-417, 936, 958; 25, p. 2; 71
	Zinc	ND (1.7 mg/kg)	6 mg/kg	16, pp. 91, 94, 378-417, 936, 958; 25, p. 2; 71
	Semivolatile Organic Compounds			
	Benzo(a)anthracene	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651, 961; 72
	Benzo(b)fluoranthene	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651, 961; 72
	Benzo(ghi)perylene	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651, 961; 72

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/CRQL	Reference(s)
PIT06 (3 ft) (Concluded)	Benzo(k)fluoranthene	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651, 961; 72
	Benzo(a)pyrene	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651, 961; 72
	Bis(2-ethylhexyl) phthalate	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651, 961; 72
	Chrysene	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651, 961; 72
	Fluoranthene	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651, 961; 72
	Indeno(1,2,3-cd) pyrene	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651, 961; 72
	Phenanthrene	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651, 961; 72
	Pyrene	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651, 961; 72
SB09 (3 ft)	**Metals**			
	Cadmium	0.14 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 410, 923, 971; 25, p. 2; 71
	Copper	0.62 U mg/kg	2.5 mg/kg	16, pp. 91, 94, 410, 923, 971; 25, p. 2; 71
	Lead	2.2 mg/kg	1 mg/kg	16, pp. 91, 94, 410, 923, 971; 25, p. 2; 71
	Manganese	0.96 U mg/kg	1.5 mg/kg	16, pp. 91, 94, 410, 923, 971; 25, p. 2; 71
	Zinc	0.25 U mg/kg	6 mg/kg	16, pp. 91, 94, 410, 923, 971; 25, p. 2; 71
	Semivolatile Organic Compounds			
	Benzo(a)anthracene	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626, 970; 72
	Benzo(b)fluoranthene	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626, 970; 72
	Benzo(ghi)perylene	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626, 970; 72

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/CRQL	Reference(s)
SB09 (3 ft) (Concluded)	Benzo(k)fluoranthene	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626, 970; 72
	Benzo(a)pyrene	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626, 970; 72
	Bis(2-ethylhexyl) phthalate	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626, 970; 72
	Chrysene	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626, 970; 72
	Fluoranthene	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626, 970; 72
	Indeno(1,2,3-cd) pyrene	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626, 970; 72
	Phenanthrene	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626, 970; 72
	Pyrene	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626, 970; 72

Notes:

--*Indicates the background sample's analytical result was estimated (J-qualified). J-qualified RI analytical results were not used in the HRS documentation record.

CRDL - Contract Required Detection Limit
SDL - Sample Detection Limit
SQL - Sample Quantitation Limit
CRQL - Contract Required Quantitation Limit
SS - Surface soil
PIT - Test pit
P1 - Phase 1
mg/kg - Milligrams per kilogram
µg/kg - Micrograms per kilogram
U - Indicates the compound/substance was analyzed for, but not detected. The associated numerical value is the SQL.
ND - Substance not detected above CRDL
( ) - Reported concentration in parentheses.

2002 Phase 2 RI Samples

In August 2002, on behalf of EPA, CDM collected a total of 32 surface soil and 26 subsurface soil samples from soil borings on RSD during Phase 2 RI sampling activities (see Figure 5) (Ref. 16, pp. 17-19, 92, 95, 180-216, 419-520). Soil borings were advanced throughout RSD, with completion of five of the borings as permanent shallow monitoring wells MW-01S through MW-05S (Ref. 16, pp. 20, 95, 122-136, 419-520). Five additional soil borings were completed as deep monitoring wells MW-01D through MW-05D and co-located with the shallow wells (Ref. 16, pp. 20, 95, 122-136, 419-520). Of the soil borings advanced during the Phase 2 RI activities, only one (MW-02) was located within the described dumping area (see Figure 5) (Ref. 16, pp. 92, 95, 419-520). All other soil borings advanced during the Phase 2 RI field investigation were determined to be outside the described dump area source and are discussed later in this section under Source No. 2 (Ref. 16, pp. 92, 95, 419-520).

Due to the random nature of dumping and the reported movement and spreading of the waste materials by a bull dozer, soil samples collected from the dumping area are considered representative of the wastes disposed in the dump source. Therefore, the analytical results of soil samples collected from within the dump area are used to characterize this source.

The concentrations of hazardous substances detected in surface and subsurface soil samples collected during the Phase 2 RI were compared to background samples collected from the soil boring completed as MW-01D. This soil boring was advanced northeast of RSD, upgradient and off site, away from RSD influences (see Figure 5) (Ref. 16, pp. 32, 85, 95, 438-444). One surface soil sample was collected from MW-01D at depth of 0.5 ft. In addition, two subsurface soil samples were collected from MW-01D at depths of 2 ft and 4 ft (Ref. 16, pp. 32, 85, 95, 438-444). MW-01D was advanced outside the test pit area in which discarded battery casings and/or landfilled waste materials were observed during the Phase 1 RI sampling activities (Ref. 16, pp. 113-120).

No additional upgradient background samples were collected during the Phase 2 RI sampling (Ref. 16, pp. 92, 95, 438-444). Consequently, in order to account for the range of naturally occurring substances, particularly metals, the analytical results of surface and subsurface soil samples collected during the Phase 2 RI were also compared to the background samples identified for the Phase 1 RI sampling. The Phase 1 RI background samples were collected from test pit six (PIT06), soil boring SS04P1, and soil boring SS09P1/SB09 (see Figure 4). Test pit six was excavated in the northeast corner of RSD, east of the birdfoot drainage canals. One surface soil sample was collected from test pit six from a depth of 0.5 ft, and one subsurface soil sample was collected from test pit six from a depth of 3 ft (Ref. 16, pp. 113-120, 378-417). Of all the text pits excavated, test pit six was located the furthest upgradient and away from the dump source (Ref. 16, pp. 84, 85, 91, 94). In addition, no discarded battery casings and/or landfilled waste materials were observed at test pit six (Ref. 16, p. 116).

Soil boring SS04P1 was located in the vicinity of the eastern power line easement, east of RSD and upgradient of the dump source (Ref. 16, pp. 91, 389, 390). One surface soil sample was collected from soil boring SS04P1 from a depth of 0.5 ft; no subsurface soil sample was collected from SS04P1 (Ref. 16, pp. 91, 389, 390). Soil boring SS09P1/SB09 was located north of the dump source, east of the birdfoot drainage canals (Ref. pp. 91, 410). One surface soil sample and one subsurface soil sample were collected from soil boring SS09P1/SB09 from depths of 0.5 ft and 3 ft, respectively (Ref. pp. 91, 410). The background soil borings were located outside the test pit area in which discarded battery casings and/or landfilled waste materials were observed (see Figure 4) (Ref. 16, pp. 113-120, 389, 390, 410).

All Phase 2 RI surface soil samples were collected from 0 to 0.5 foot below grade (Ref. 16, p. 18, 419-520). All Phase 2 RI subsurface soil samples were collected at depths ranging from 2 to 5 feet below grade (Ref. 16, pp. 19, 419-520). Several subsurface soil samples collected during the Phase 2 RI were reported to have been collected from a depth of 2 feet (Ref. 16, pp. 201-216, 419-520). However, no range

of sample depths was provided for the subsurface soil samples (Ref. 16, pp. 201-216, 419-520). All soil samples reported to have been collected from a depth of 2 feet or greater are evaluated as subsurface soil samples in this HRS documentation record. Sample collection depths are presented in parentheses in the analytical data table below.

For some of the Phase 2 RI soil samples, variations in the sample identification/location numbers presented in Reference 16 exist. In some cases, the sample collection depth was incorporated into the sample identification number listed on the chain-of-custody (COC) records or laboratory analytical data sheets presented in Reference 16. For example, for soil boring station B01, three samples were collected from the following depths: 0.5, 3.0, and 5.0 feet below grade (Ref. 16, pp. 95, 498, 501). On the COC records, the samples are listed as B-1-0, B-1-3, and B-1-5, respectively (Ref. 16, pp. 1487, 1488). However, on the laboratory analytical data sheets, the samples are listed as B10, B13, and B15, respectively (Ref. 16, pp. 996, 1138, 1139). Moreover, for duplicate samples, a number “5" is incorporated into the sample identification number. For example, a duplicate sample was collected from the 0.5-foot soil sample collected from soil boring station B07 (Ref. 16, p. 502). On the COC records, the duplicate sample is listed as B-57-0 (Ref. 16, pp. 1494, 1500). On the laboratory analytical data sheets, the duplicate sample is listed as B570 (Ref. 16, p. 1003). In the cases where sample identification numbers are significantly inconsistent, both sample identification numbers are included in the analytical data tables below.

In general, Phase 2 RI surface soil samples consisted of olive gray to olive black, very fine sand with some silt. In addition, almost all the surface soil samples contained some organic material (e.g., roots) and/or minor amounts of waste materials, including battery casing pieces, concrete rubble and gravel, and/or brick material (Ref. 16, pp. 419-520). Phase 2 RI subsurface soil samples consisted primarily of olive grey to yellowish brown, very fine sand to silt, with some clay (Ref. 16, pp. 419-520).

In regards to the Phase 1 RI background samples, surface soil samples collected from test pits primarily consisted of yellowish brown, fine silty sand. A few contained olive grey to black, fine silty sand. In addition, almost all the surface soil samples collected from the test pits contained some organic material (e.g., roots) and/or minor amounts of waste materials (Ref. 16, pp. 113-120, 378-417). In general, Phase 1 RI subsurface soil samples collected from test pits consisted of yellowish brown or light olive grey fine to very fine silty sand and sandy clay. Some of the subsurface soil samples also contained organic material (e.g., roots) and/or waste materials (Ref. 16, pp. 113-120, 378-417).

Phase 1 RI surface soil samples collected from soil borings generally consisted of yellowish brown and/or olive grey, very fine to fine silty sand with some organic material and occasional waste materials (Ref. 16, pp. 378-417). The background soil samples and the soil samples from the source area were collected from similar depths, employed the same sampling method, and consisted of similar soil types (Ref. 16, pp. 21, 41, 42, 378-417, 419-520, 538-953).

The table below contains elevated concentrations of hazardous substances detected in soil samples collected from soil borings advanced within the dumping area (see Figure 5) (Ref. 16, pp. 92, 95, 419-520). Soil samples collected during the Phase 2 RI were analyzed by an EPA CLP laboratory; analytical data sheets are provided in Reference 16, pp. 538-953. Data validation was conducted by EPA Region 4 SESD (Refs. 16, pp. 21, 41, 42; 73-78). The CRDLs are provided in lieu of SDLs for inorganic substances. The CRDLs are listed in Reference 25 (Ref. 25, p. 2). For organic substances, the CRQL is used instead of the SQL for samples in which the SQL is not apparent from the sample data (Ref. 26, p. 2).

Because sufficient non-qualified data are available, Phase 2 RI analytical results that were estimated (J-qualified) are not included in this HRS documentation record (Refs. 73-78).

Hazardous Substance	Evidence	SDL/CRDL/ SQL/CRQL	Reference(s)
MATRIX: Soil Borings - Surface Soil			
Metals			
Arsenic	MW02D (0.5 ft) 5.5 mg/kg SSMW2D	1 mg/kg	16, pp. 92, 95, 419-520, 1006, 1496; 25, p. 2; 75; 77
Barium	MW02D (0.5 ft) 260 mg/kg SSMW2D	20 mg/kg	16, pp. 92, 95, 419-520, 1006, 1496; 25, p. 2; 75; 77
Cadmium	MW02D (0.5 ft) 1.0 mg/kg SSMW2D	0.5 mg/kg	16, pp. 92, 95, 419-520, 1006, 1496; 25, p. 2; 75; 77
Chromium	MW02D (0.5 ft) 30 mg/kg SSMW2D	1 mg/kg	16, pp. 92, 95, 419-520, 1006, 1496; 25, p. 2; 75; 77
Mercury	MW02D (0.5 ft) 0.33 mg/kg SSMW2D	0.1 mg/kg	16, pp. 92, 95, 419-520, 1006, 1496; 25, p. 2; 75; 77
Semivolatile Organic Compounds			
Anthracene	MW02D (0.5 ft) 1,300 µg/kg SSMW2D	1,300 µg/kg	16, pp. 92, 95, 419-520, 1068, 1499; 74; 76; 78
Benzo(a) anthracene	MW02D (0.5 ft) 4,300 µg/kg SSMW2D	1,300 µg/kg	16, pp. 92, 95, 419-520, 1068, 1499; 74; 76; 78
Benzo(b) fluoranthene	MW02D (0.5 ft) 4,300 µg/kg SSMW2D	1,300 µg/kg	16, pp. 92, 95, 419-520, 1068, 1499; 74; 76; 78
Benzo(k) fluoranthene	MW02D (0.5 ft) 3,300 µg/kg SSMW2D	1,300 µg/kg	16, pp. 92, 95, 419-520, 1068, 1499; 74; 76; 78
Benzo(a)pyrene	MW02D (0.5 ft) 3,700 µg/kg SSMW2D	1,300 µg/kg	16, pp. 92, 95, 419-520, 1068, 1499; 74; 76; 78
Butylbenzyl-phthalate	MW02D (0.5 ft) 6,200 µg/kg SSMW2D	1,300 µg/kg	16, pp. 92, 95, 419-520, 1068, 1499; 74; 76; 78
Chrysene	MW02D (0.5 ft) 4,700 µg/kg SSMW2D	1,300 µg/kg	16, pp. 92, 95, 419-520, 1068, 1499; 74; 76; 78
Fluoranthene	MW02D (0.5 ft) 9,700 µg/kg SSMW2D	1,300 µg/kg	16, pp. 92, 95, 419-520, 1068, 1499; 74; 76; 78
Indeno(1,2,3-cd) pyrene	MW02D (0.5 ft) 2,600 µg/kg SSMW2D	1,300 µg/kg	16, pp. 92, 95, 419-520, 1068, 1499; 74; 76; 78
Phenanthrene	MW02D (0.5 ft) 5,200 µg/kg SSMW2D	1,300 µg/kg	16, pp. 92, 95, 419-520, 1068, 1499; 74; 76; 78
Pyrene	MW02D (0.5 ft) 6,700 µg/kg SSMW2D	1,300 µg/kg	16, pp. 92, 95, 419-520, 1068, 1499; 74; 76; 78

Notes:

CRDLS - Contract Required Detection Limit
SDL - Sample Detection Limit
SQL - Sample Quantitation Limit
CRQL - Contract Required Quantitation Limit
ft - Feet
MW - Monitor Well
D - Deep
mg/kg - Milligrams per kilogram
µg/kg - Micrograms per kilogram

-Background samples - 2002 Phase 2 RI Samples

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/CRQL	Reference(s)
MATRIX: Surface Soil				
MW01D (0.5 ft) SSMW1D	**Metals**			
	Arsenic	0.79 U mg/kg	1 mg/kg	16, pp. 92, 95, 419-520, 1005, 1488; 25, p. 2; 75; 77
	Barium	ND (1.9 mg/kg)	20 mg/kg	16, pp. 92, 95, 419-520, 1005, 1488; 25, p. 2; 75; 77
	Cadmium	0.22 U mg/kg	0.5 mg/kg	16, pp. 92, 95, 419-520, 1005, 1488; 25, p. 2; 75; 77
	Chromium	ND (0.78 mg/kg)	1 mg/kg	16, pp. 92, 95, 419-520, 1005, 1488; 25, p. 2; 75; 77
	Mercury	0.11 U mg/kg	0.1 mg/kg	16, pp. 92, 95, 419-520, 1005, 1488; 25, p. 2; 75; 77
	Semivolatile Organic Compounds			
	Anthracene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78
	Benzo(a)anthracene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78
	Benzo(b)fluoranthene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78
	Benzo(k)fluoranthene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78
	Benzo(a)pyrene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78
	Butylbenzylphthalate	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/CRQL	Reference(s)
MW01D (0.5 ft) SSMW1D (Concluded)	Chrysene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78
	Fluoranthene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78
	Indeno(1,2,3-cd) pyrene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78
	Phenanthrene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78
	Pyrene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78
PIT06 (0.5 ft)	**Metals**			
	Arsenic	0.91 U mg/kg	1 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Barium	ND (3.8 mg/kg)	20 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Cadmium	0.13 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Chromium	–-*	1 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Mercury	0.05 U mg/kg	0.1 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Semivolatile Organic Compounds			
	Anthracene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Benzo(a)anthracene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Benzo(b)fluoranthene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Benzo(k)fluoranthene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Benzo(a)pyrene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Butylbenzylphthalate	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Chrysene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Fluoranthene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Indeno(1,2,3-cd) pyrene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Phenanthrene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/CRQL	Reference(s)
PIT06 (0.5 ft) concluded	Pyrene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
SS04P1 (0.5 ft)	**Metals**			
	Arsenic	0.91 U mg/kg	1 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Barium	ND (2.9 mg/kg)	20 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Cadmium	0.13 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Chromium	--*	1 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Mercury	0.05 U mg/kg	0.1 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Semivolatile Organic Compounds			
	Anthracene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Benzo(a)anthracene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Benzo(b)fluoranthene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Benzo(k)fluoranthene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Benzo(a)pyrene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Butylbenzylphthalate	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Chrysene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Fluoranthene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Indeno(1,2,3-cd) pyrene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Phenanthrene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Pyrene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
SS09P1 (0.5 ft)	**Metals**			
	Arsenic	1.3 U mg/kg	1 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Barium	--* mg/kg	20 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Cadmium	0.18 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/CRQL	Reference(s)
SS09P1 (0.5 ft) (Concluded)	Chromium	5.6 mg/kg	1 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Mercury	0.11 U mg/kg	0.1 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Semivolatile Organic Compounds			
	Anthracene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 569, 569; 72
	Benzo(a)anthracene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72
	Benzo(b)fluoranthene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72
	Benzo(k)fluoranthene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72
	Benzo(a)pyrene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72
	Butylbenzylphthalate	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72
	Chrysene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72
	Fluoranthene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72
	Indeno(1,2,3-cd) pyrene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72
	Phenanthrene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72
	Pyrene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72

Notes:

--*Indicates the background sample's analytical result was estimated (J-qualified). J-qualified RI analytical results were not used in the HRS documentation record.

CRDLS - Contract Required Detection Limit
SDL - Sample Detection Limit
SQL - Sample Quantitation Limit
CRQL - Contract Required Quantitation Limit
ft - Feet
MW - Monitor Well
mg/kg - Milligrams per kilogram
µg/kg - Micrograms per kilogram
U - Indicates the compound/substance was analyzed for, but not detected. The associated numerical value is the SQL.
ND - Substance not detected above CRDL
( ) - Reported concentration in parentheses.

2.4.2 Hazardous Waste Quantity

2.4.2.1 Source Hazardous Waste Quantity

2.4.2.1.1 Hazardous Constituent Quantity

The amount of crushed battery casings, debris, and trash deposited in the dump is unknown. Because the information available is insufficient to evaluate Tier A as required in Section 2.4.2.1.1 of the HRS Rule, the evaluation of Hazardous Waste Quantity (HWQ) proceeds to the evaluation of Tier B, Hazardous Wastestream Quantity.

2.4.2.1.2 Hazardous Wastestream Quantity

The amount of crushed battery casings, debris, trash, and their constituents is unknown. Because the information available is insufficient to evaluate Tier B as required in Section 2.4.2.1.2 of the HRS Rule, the evaluation of HWQ proceeds to the evaluation of Tier C, Volume.

2.4.2.1.3 Volume

The depth of the dump has not been determined. Because the information available is insufficient to evaluate Tier C as required in Section 2.4.2.1.3 of the HRS Rule, the evaluation of HWQ proceeds to the evaluation of Tier D, Area.

2.4.2.1.4 Area

Information is inconsistent regarding the size of the dump. According to an analysis of available historical aerial photographs, the dump was approximately 3.0 acres in 1980 (Refs. 8, pp. 20-26; 22, p. 1). However, previous investigations of RSD have reported the dump to be approximately 5.2 acres (Refs. 6, p. 1; 9, p. 2; 15, p. 1).

In March 2001, as part of the RI and on behalf of EPA, CDM excavated 13 test pits on RSD, primarily north of Raleigh Street and its extension (Ref. 16, pp. 51, 91). Fill materials were encountered in 10 of the 13 test pits (Ref. 16, pp. 51, 113-120). The thickness of the landfilled material ranges in depth from 1 to 7 feet, and the ground surface at every test pit location was littered with broken battery casings, construction debris, and/or trash (Ref. 16, pp. 51, 113-120). In addition, soil samples collected from the dump area during the ESI and RI revealed the presence of elevated concentrations of hazardous substances, including metals commonly associated with battery reclamation facilities (Refs. 9, Appendix A; 16, Appendix H; 4, p. 4; 55, pp. 1, 2; 56).

The landfill (dump) was estimated using geographic information system (GIS) computer software and a geographically referenced aerial photograph (i.e., digital orthoquarter quadrangle [DOQQ]) (Ref. 59). All locations of test pits excavated during the Phase 1 RI and locations of soil samples collected during the ESI and RI were added to the DOQQ view. The limits of the dump were generally delineated based on observations recorded during test pit excavation and the analytical results of soil samples collected from the dump area source (Ref. 59). Reference No. 59 of this HRS documentation record details the method used to estimate the area of Source No. 1. Using this information, the landfill was estimated to be approximately 3.0 acres (130,680 square feet [ft^2]) (Refs. 22; 29).

Area of source (ft^2): 130,680 ft^2

Area Assigned Value: 130,680 ft^2 ÷ 3,400 = 38.435
Reference: 1, Table 2-5

2.4.2.1.5 Source Hazardous Waste Quantity Value

Source Hazardous Waste Quantity Value: 38.435

SOURCE DESCRIPTION

2.2 SOURCE CHARACTERIZATION

Number of the source: 2

Name and description of the source: Contaminated soil

HRS Source Type: Contaminated soil

RSD was previously used by Chloride Metals, a nearby former battery manufacturing plant and secondary lead smelter which recovered lead from old lead-acid storage batteries, for the disposal of fill material containing battery casings, smelter slag, and miscellaneous debris (Refs. 4, pp. 1, 3; 5, pp. 1, 4, 5, 15, 17, 24; 6, p. 3). “Midnight dumping” of various other waste materials, including construction and demolition debris, by unknown persons also occurred at RSD (Refs. 4, p. 3; 5, p. 3; 7, p. 15). The owner of the RSD property at the time of dumping reportedly allowed dumping and used a bulldozer to spread the material over low-lying (wetland) areas and to keep the material away from the road (Ref. 4, p. 3).

Based on analytical results of soil samples collected during the ESI and RI, areas of contaminated soil are located throughout the property, including the southern portion of RSD. Elevated concentrations of hazardous substances present in the contaminated soil are consistent with those associated with the former Chloride Metals facility and/or those detected in soil samples collected from the dump area (Source No. 1) (Ref. 4, pp. 3-4; 55, pp. 1, 2; 56). The contaminated soil contains elevated concentrations of numerous metals (arsenic, barium, beryllium, cadmium, copper, lead, manganese, nickel, and zinc) and PAHs (benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, naphthalene, phenanthrene, and pyrene) (Refs. 9, p. 10, Table 6, Appendix A; 16, pp. 17-19, 113-120, 180-216, 378-417).

Visible evidence of battery casing chips has been observed throughout RSD beyond the dump proper scored as Source 1 (Refs. 10, pp. 1, 4, 21; 15, p. 7).

Location of the source, with reference to a map of the site: Contaminated soil is located throughout the property. This comprises the entire area suspected to be part of RSD (see Figures 3, 4, and 5).

Containment

Release to surface water via overland flow: From approximately 1977 through 1980, RSD was used for the for the disposal of fill material containing battery casings, smelter slag, and miscellaneous debris from the nearby Chloride Metals facility. In addition, “midnight dumping” of various other waste materials, including construction and demolition debris, by unknown persons also occurred at RSD (Refs. 4, p. 3; 8, pp. 21-25). No dam or berm is present to prevent releases to surrounding surface water bodies. No maintained engineered cover or functioning and maintained run-on control system and runoff management system exists for the source (Refs. 12, p. 1; 16, pp. 51, 53). This information, applied to Table 4-2 in Reference 1, yields a containment factor value of 10.

2.4 WASTE CHARACTERISTICS

2.4.1 Hazardous Substances

1998 ESI Samples

During the week of August 24, 1998, as part of the ESI and on behalf of EPA, TT-EMI START collected nine surface soil samples (RSDS-01-SS through RSDS-09-SS) and nine co-located subsurface soil samples (RSDS-01-SB through RSDS-09-SB) from source areas at RSD (see Figure 3) (Refs. 7, pp. 10, 13-18; 9, pp. 9-13; 24, pp. 4-10; 68, pp. 1-2; 69; 70). Soil samples RSDS-SS-01 and RSDS-01-SB were collected north of RSD, northeast of the birdfoot drainage canals and upgradient of potential source areas, in order to establish reference concentrations for surface soil and subsurface soil sample comparisons, respectively (Refs. 7, p. 13; 9, pp. 10, 12-13; 24, p. 5; 68, pp. 2, 3, 17, 18). All the soil sampling stations were located within the dump area (Source No. 1) with the exception of the background station and two others (RSDS-06-SS/SB and RSDS-08-SS/SB), which were collected from the southern portion of RSD (see Figure 3) (Refs. 7, pp. 10, 13-18; 9, pp. 9-13; 24, pp. 4-10).

All surface soil samples were collected from a depth of 0 to 3 inches, and all subsurface soil samples were collected from the soil/ground water interface or at refusal, resulting in depths ranging from 2 to 4 ft (Refs. 7, pp. 10, 13-18; 9, p. 9). Sample collection depths are presented in parentheses in the analytical data table below.

The soil samples were collected using a hand auger (Refs. 7, pp. 1-19; 9, p. 9). The physical description of surface soil samples ranged from grey, silty clay and sand to black sandy topsoil. Some organic material was also observed in the surface soil samples (Ref. 7, pp. 10-19). Subsurface soil samples consisted of tan to grey, silty clay and sand (Ref. 7, pp. 10-19). The background soil samples and the soil samples from the source area were collected from similar depths, employed the same sampling method, and consisted of similar soil types, Ref. 7, pp. 1-19; 9, pp. 9, Appendix A).

The table below contains elevated concentrations of hazardous substances detected in soil samples collected from contaminated soil located throughout RSD. Samples were analyzed by an EPA CLP laboratory; analytical data sheets are provided in Reference 9, Appendix A. Data validation was conducted by EPA Region 4 SESD (Refs. 9, Appendix A; 69; 70). The CRDLs are provided in lieu of SDLs for inorganic substances. The CRDLs are listed in Reference 25 (Ref. 25, p. 2). For organic substances, the CRQL is used instead of the SQL for samples in which the SQL is not apparent from the sample data (Ref. 26, p. 2).

Hazardous Substance	Evidence			SDL/CRDL/ SQL/CRQL	Reference(s)
MATRIX: Surface Soil					
Metals					
Lead	RSDS-06-SS (0 to 3 in.) RSDS-08-SS (0 to 3 in.)	170 370	mg/kg mg/kg	1 mg/kg	7, p. 10; 9, pp. 10, 12, Appendix A - pp. 143, 145; 24, p.9; 25, p. 2; 68, pp. 4, 9; 69, pp. 3, 4
Manganese	RSDS-06-SS (0 to 3 in.)	300	mg/kg	1.5 mg/kg	9, pp. 10, 12, Appendix A - p. 143; 24, p. 9; 25, p. 2; 68, p. 9; 69, pp. 3, 4

Hazardous Substance	Evidence			SDL/CRDL/ SQL/CRQL	Reference(s)
Zinc	RSDS-06-SS (0 to 3 in.)	260	mg/kg	6 mg/kg	9, pp. 10, 12, Appendix A - p. 143; 24, p. 9; 25, p. 2; 68, p. 9; 69, pp. 3, 4
Semivolatile Organic Compounds					
Butylbenzyl-phthalate	RSDS-06-SS (0 to 3 in.)	3,700 J*	µg/kg	380 µg/kg	9, pp. 10, 12, Appendix A - p. 202; 24, p. 9; 27, p. 6; 68, p. 15; 70, pp. 1, 2
Dimethyl phthalate	RSDS-06-SS (0 to 3 in.)	250,000	µg/kg	380 µg/kg	7, p. 10; 9, pp. 10, 12, Appendix A - pp. 202, 206; 24, p. 9; 68, pp. 15, 19; 70, pp. 1, 2
	RSDS-08-SS (0 to 3 in.)	820	µg/kg	500 µg/kg	
Di-n-butyl phthalate	RSDS-06-SS (0 to 3 in.)	1,100	µg/kg	380 µg/kg	9, pp. 10, 12, Appendix A - p. 202; 24, p. 9; 68, p. 15; 70, pp. 1, 2
Hexachloroethane	RSDS-06-SS (0 to 3 in.)	630 (6,300 J*)	µg/kg	380 µg/kg	9, pp. 10, 12, Appendix A - p. 202; 24, p. 9; 27, p. 5; 68, p. 15; 70, pp. 1, 2
Phenol	RSDS-06-SS (0 to 3 in.)	680	µg/kg	380 µg/kg	9, pp. 10, 12, Appendix A - p. 202; 24, p. 9; 68, p. 15; 70, pp. 1, 2

Notes:

CRDLS - Contract Required Detection Limit
SDL - Sample Detection Limit
SQL - Sample Quantitation Limit
CRQL - Contract Required Quantitation Limit
RSDS - Raleigh Street Dump Site
SS - Surface soil
SB - Subsurface soil
mg/kg - Milligrams per kilogram
µg/kg - Micrograms per kilogram
J* - Estimated concentration adjusted in accordance with Reference 28 (see Reference 27).

-Background samples - 1998 ESI Samples

Sample ID	Hazardous Substance	Concentration	SDL/SQL/ CRDLS/CRQL	Reference(s)
RSDS-01-SS (0 to 3 in.)	**Metals**			
	Lead	43 mg/kg	1 mg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 138; 25, p. 2; 68, p. 2; 69, pp. 3, 4
	Manganese	56 mg/kg	1.5 mg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 138; 25, p. 2; 68, p. 2; 69, pp. 3, 4
	Zinc	20 U mg/kg	6 mg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 138; 25, p. 2; 68, p. 2; 69, pp. 3, 4
	Semivolatile Organic Compounds			
	Benzyl butyl-phthalate	450 U µg/kg	450 µg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 194; 68, p. 17; 70, pp. 1, 2
	Dimethyl phthalate	450 U µg/kg	450 µg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 194; 68, p. 17; 70, pp. 1, 2
	Di-n-butyl phthalate	450 U µg/kg	450 µg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 194; 68, p. 17; 70, pp. 1, 2
	Hexachloroethane	450 U µg/kg	450 µg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 194; 68, p. 17; 70, pp. 1, 2
	Phenanthrene	450 U µg/kg	450 µg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 194; 68, p. 17; 70, pp. 1, 2
	Phenol	450 U µg/kg	450 µg/kg	7, pp. 12, 13; 9, pp. 10, 12, Appendix A - p. 194; 68, p. 17; 70, pp. 1, 2

Notes:

CRDLS - Contract Required Detection Limit
SDL - Sample Detection Limit
SQL - Sample Quantitation Limit
CRQL - Contract Required Quantitation Limit
RSDS - Raleigh Street Dump Site
SS - Surface soil
mg/kg - Milligrams per kilogram
µg/kg - Micrograms per kilogram
U - Indicates the compound/substance was analyzed for, but not detected. The associated numerical value is the SQL.

2001 Phase 1 RI Samples

In March 2001, on behalf of EPA, CDM collected a total of 39 surface soil and 26 subsurface soil samples from 13 test pits and 20 soil borings on RSD during Phase 1 RI sampling activities (see Figure 4) (Ref. 16, pp. 17-19, 113-120, 180-216, 378-417). The soil samples listed in the table below were collected from contaminated soil located throughout the northern and southern portions of the property (Ref. 16, pp. 17-19, 113-120, 180-216, 378-417).

No soil samples collected during the Phase 1 RI sampling activities were collected specifically to represent background levels; the RI used the 1998 ESI background soil samples for comparison to the Phase 1 RI soil samples (Ref. 29, p. 1). However, for the purposes of this HRS documentation record, the concentrations of hazardous substances detected in the Phase 1 RI soil samples were compared to samples collected during the Phase 1 RI sampling, instead of the earlier ESI background soil samples. This was done in order to establish more similarity (e.g., sample depth, collection method, timing, etc.) between the background samples and the samples collected from the suspected source area.

For the Phase I RI sampling, in order to account for the range of naturally occurring substances, particularly metals, surface and subsurface soil samples collected from multiple locations were chosen to represent background levels. These locations included test pit six (PIT06), soil boring SS04P1, and soil boring SS09P1/SB09. Test pit six was excavated in the northeast corner of RSD, east of the birdfoot drainage canals. One surface soil sample was collected from test pit six from a depth of 0.5 ft, and one subsurface soil sample was collected from test pit six from a depth of 3 ft (Ref. 16, pp. 113-120, 378-417). Of all the text pits excavated, test pit six was located the furthest upgradient and away from the dump source (Ref. 16, pp. 84, 85, 91, 94). In addition, no discarded battery casings and/or landfilled waste materials were observed at test pit six (Ref. 16, p. 116).

Soil boring SS04P1 was located in the vicinity of the eastern power line easement, east of RSD and upgradient of the dump source (Ref. 16, pp. 91, 389, 390). One surface soil sample was collected from soil boring SS04P1 from a depth of 0.5 ft; no subsurface soil sample was collected from SS04P1 (Ref. 16, pp. 91, 389, 390). Soil boring SS09P1/SB09 was located north of the dump source, east of the birdfoot drainage canals (Ref. pp. 91, 410). One surface soil sample and one subsurface soil sample were collected from soil boring SS09P1/SB09 from depths of 0.5 ft and 3 ft, respectively (Ref. pp. 91, 410). The background soil borings were located outside the test pit area in which discarded battery casings and/or landfilled waste materials were observed (see Figure 4) (Ref. 16, pp. 113-120, 389, 390, 410).

All surface soil samples were collected from 0 to 0.5 foot below grade during the Phase 1 RI field investigation (Ref. 16, pp. 18, 378-417). An additional soil sample was collected from PIT07 from a depth of 1 foot below grade; however, this sample was described as subsurface in the RI Report (Ref. 16, pp. 117, 407). In regards to subsurface soil samples, they were collected at depths ranging from 2 to 10 feet below grade (Ref. 16, pp. 19, 114-120, 378-417). Several subsurface soil samples collected during the Phase 1 RI were reported to have been collected from a depth of 2 feet (Ref. 16, pp. 114-120, 378-417). However, no range of sample depths was provided for these subsurface soil samples (Ref. 16, pp. 114-120, 378-417). All soil samples reported to have been collected from a depth of 2 feet or greater are evaluated as subsurface soil samples in this HRS documentation record. Sample collection depths are presented in parentheses in the analytical data table below.

For some of the Phase 1 RI soil samples, variations in the sample identification/location numbers presented in Reference 16 exist. For example, soil sample SS01P1 is presented as such on the sample location figures and in the data summary tables (Appendix D) of Reference 16 (Ref. 16, pp. 91, 182, 192). However, on the chain-of-custody (COC) records and laboratory analytical data sheets presented in Appendix H of Reference 16, the sample identification is listed as SS01 or SS-01(Ref. 16, pp. 887, 955, 956). Furthermore, for duplicate samples collected during the Phase

1 RI, additional variations in sample identification numbers exists. For example, a duplicate surface soil sample was collected from test pit 14 (PIT14) (Ref. 16, pp. 70, 91, 120, 182, 192, 403). In the field log notes and in the test pit logs, the duplicate sample is listed as RSDS24-TPSS (Ref. 16, pp. 70, 120, 403). However, on the COC, the sample is listed as TEST PIT 24, and on the laboratory analytical data sheets the sample is listed as PIT24 (Ref. 16, pp. 921, 963).

Surface soil samples collected from test pits primarily consisted of yellowish brown, fine silty sand. A few contained olive grey to black, fine silty sand. In addition, almost all the surface soil samples collected from the test pits contained some organic material (e.g., roots) and/or varying amounts of waste materials (Ref. 16, pp. 113-120, 378-417). In general, subsurface soil samples collected from test pits consisted of yellowish brown or light olive grey fine to very fine silty sand and sandy clay. Some of the subsurface soil samples also contained organic material (e.g., roots) and/or waste materials (Ref. 16, pp. 113-120, 378-417). Surface soil samples collected from soil borings generally consisted of yellowish brown and/or olive grey, very fine to fine silty sand with some organic material and occasional waste materials (Ref. 16, pp. 378-417). The background soil samples and the soil samples from the source area were collected from similar depths, employed the same sampling method, and consisted of similar soil types (Ref. 16 pp. 41, 113-120, 378-417, 538-953).

The table below contains elevated concentrations of hazardous substances detected in soil samples collected from test pits (PIT01, PIT02, and PIT07) excavated in the area of contaminated soil. Also, soil samples collected from soil borings advanced within the area of contaminated soil are included in the table below (see Figure 4) (Ref. 16, pp. 51, 91, 94, 113-120, 180-216).

All soil samples collected during the Phase 1 RI were analyzed by an EPA CLP laboratory; analytical data sheets are provided in Reference 16, pp. 538-953. All data validation was conducted by EPA Region 4 SESD (Refs. 16, p. 41; 71; 72). The CRDLs are provided in lieu of SDLs for inorganic substances. The CRDLs are listed in Reference 25 (Ref. 25, p. 2). For organic substances, the CRQL is used instead of the SQL for samples in which the SQL is not apparent from the sample data (Ref. 26, p. 2).

Because sufficient non-qualified data are available, Phase 1 RI analytical results that were estimated (J-qualified) are not included in this HRS documentation record (Refs. 71; 72).

Hazardous Substance	Evidence			SDL/CRDL/ SQL/CRQL	Reference(s)
MATRIX: Test Pits - Surface Soil					
Metals					
Cadmium	PIT07 (0.5 ft) PIT07 (1 ft)	3.8 0.53	mg/kg mg/kg	0.5 mg/kg	16, pp. 91, 94, 378-417, 914, 937; 25, p. 2; 71
Copper	PIT02 (0.5 ft) PIT07 (0.5 ft) PIT07 (1 ft)	15 45 76	mg/kg mg/kg mg/kg	2.5 mg/kg	16, pp. 91, 94, 378-417, 909, 914, 937; 25, p. 2; 71
Lead	PIT02 (0.5 ft) PIT07 (0.5 ft) PIT07 (1 ft)	4,400 230 25,000	mg/kg mg/kg mg/kg	1 mg/kg	16, pp. 91, 94, 378-417, 909, 914, 937; 25, p. 2; 71
Manganese	PIT02 (0.5 ft) PIT07 (0.5 ft) PIT07 (1 ft)	30 200 68	mg/kg mg/kg mg/kg	1.5 mg/kg	16, pp. 91, 94, 378-417, 908, 909, 914, 937; 25, p. 2; 71

Hazardous Substance	Evidence			SDL/CRDL/ SQL/CRQL	Reference(s)
Nickel	PIT02 (0.5 ft) PIT07 (0.5 ft)	38 13	mg/kg mg/kg	4 mg/kg	16, pp. 91, 94, 378-417, 909, 914, 937; 25, p. 2; 71
Vanadium	PIT02 (0.5 ft)	40	mg/kg	5 mg/kg	16, pp. 91, 94, 378-417, 909; 25, p. 2; 71
Zinc	PIT07 (0.5 ft)	230	mg/kg	6 mg/kg	16, pp. 91, 94, 378-417, 914; 25, p. 2; 71
Semivolatile Organic Compounds					
Benzaldehyde	PIT07 (1 ft)	1,300	µg/kg	410 µg/kg	16, pp. 91, 94, 378-417, 653; 72
Bis(2-ethylhexyl) phthalate	PIT07 (1 ft)	12,000	µg/kg	410 µg/kg	16, pp. 91, 94, 378-417, 653; 72
Fluoranthene	PIT07 (0.5 ft)	650	µg/kg	390 µg/kg	16, pp. 91, 94, 378-417, 608; 72
Naphthalene	PIT07 (1 ft)	650	µg/kg	410 µg/kg	16, pp. 91, 94, 378-417, 653; 72
Phenanthrene	PIT07 (1 ft)	580	µg/kg	410 µg/kg	16, pp. 91, 94, 378-417, 653; 72
Pyrene	PIT07 (0.5 ft)	640	µg/kg	390 µg/kg	16, pp. 91, 94, 378-417, 608; 72
MATRIX: Test Pits - Subsurface Soil					
Metals					
Lead	PIT02 (6 ft)	22	mg/kg	1 mg/kg	16, pp. 91, 94, 378-417, 930; 25, p. 2; 71
Manganese	PIT02 (6 ft)	13	mg/kg	1.5 mg/kg	16, pp. 91, 94, 378-417, 930; 25, p. 2; 71
Vanadium	PIT02 (3 ft)	54	mg/kg	5 mg/kg	16, pp. 91, 94, 378-417, 929; 25, p. 2; 71
MATRIX: Soil Borings - Surface Soil					
Metals					
Beryllium	SS14P1 (0.5 ft)	1.2	mg/kg	0.5 mg/kg	16, pp. 91, 94, 378-417, 887-907; 25, p. 2; 71
Cadmium	SS13P1 (0.5 ft)	3.1	mg/kg	0.5 mg/kg	16, pp. 91, 94, 378-417, 887-907; 25, p. 2; 71
Copper	SS02P1 (0.5 ft) SS12P1 (0.5 ft) SS13P1 (0.5 ft) SS14P1 (0.5 ft) SS19P1 (0.5 ft)	29 58 70 91 12	mg/kg mg/kg mg/kg mg/kg mg/kg	2.5 mg/kg	16, pp. 91, 94, 378-417, 887-907; 25, p. 2; 71

Hazardous Substance	Evidence			SDL/CRDL/ SQL/CRQL	Reference(s)
Lead	SS01P1 (0.5 ft)	220	mg/kg	1 mg/kg	16, pp. 91, 94, 378-417, 887-907; 25, p. 2; 71
	SS02P1 (0.5 ft)	2,200	mg/kg		
	SS12P1 (0.5 ft)	920	mg/kg		
	SS13P1 (0.5 ft)	6,600	mg/kg		
	SS19P1 (0.5 ft)	330	mg/kg		
Manganese	SS01P1 (0.5 ft)	5.8	mg/kg	1.5 mg/kg	16, pp. 91, 94, 378-417, 887-907; 25, p. 2; 71
	SS02P1 (0.5 ft)	170	mg/kg		
	SS12P1 (0.5 ft)	630	mg/kg		
	SS13P1 (0.5 ft)	5,900	mg/kg		
	SS14P1 (0.5 ft)	59	mg/kg		
	SS15P1 (0.5 ft)	17	mg/kg		
	SS16P1 (0.5 ft)	13	mg/kg		
Nickel	SS02P1 (0.5 ft)	12	mg/kg	4 mg/kg	16, pp. 91, 94, 378-417, 887-907; 25, p. 2; 71
	SS12P1 (0.5 ft)	15	mg/kg		
	SS13P1 (0.5 ft)	16	mg/kg		
	SS14P1 (0.5 ft)	16	mg/kg		
Vanadium	SS12P1 (0.5 ft)	17	mg/kg	5 mg/kg	16, pp. 91, 94, 378-417, 887-907; 25, p. 2; 71
	SS13P1 (0.5 ft)	48	mg/kg		
	SS14P1 (0.5 ft)	17	mg/kg		
Zinc	SS12P1 (0.5 ft)	9,300	mg/kg	6 mg/kg	16, pp. 91, 94, 378-417, 887-907; 25, p. 2; 71
	SS13P1 (0.5 ft)	420	mg/kg		
	SS14P1 (0.5 ft)	110	mg/kg		
Semivolatile Organic Compounds					
Acetophenone	SS13P1 (0.5 ft)	1,500	µg/kg	380 µg/kg	16, pp. 91, 94, 378-417, 576; 72
Dimethyl phthalate	SS13P1 (0.5 ft)	23,000	µg/kg	380 µg/kg	16, pp. 91, 94, 378-417, 576; 72
Di-n-buytyl phthalate	SS13P1 (0.5 ft)	930	µg/kg	380 µg/kg	16, pp. 91, 94, 378-417, 576; 72
Hexachloroethane	SS13P1 (0.5 ft)	1,000	µg/kg	380 µg/kg	16, pp. 91, 94, 378-417, 576; 72
Polychlorinated Biphenyls					
Aroclor 1260	SS12P1 (0.5 ft)	120	µg/kg	39 µg/kg	16, pp. 91, 94, 378-417, 825; 72

Notes:

CRDLS - Contract Required Detection Limit
SDL - Sample Detection Limit
SQL - Sample Quantitation Limit
CRQL - Contract Required Quantitation Limit
ft - Feet
SS - Surface soil
P1 - Phase 1
mg/kg - Milligrams per kilogram
µg/kg - Micrograms per kilogram

-Background samples - 2001 Phase 1 RI Samples

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/CRQL	Reference(s)
MATRIX: Surface Soil				
PIT06 (0.5 ft)	**Metals**			
	Beryllium	0.04 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Cadmium	0.13 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Copper	ND (1.1 mg/kg)	2.5 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Lead	58 mg/kg	1 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Manganese	2.3 U mg/kg	1.5 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Nickel	ND (0.51 mg/kg)	4 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Vanadium	ND (1.2 mg/kg)	5 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Zinc	26 mg/kg	6 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Semivolatile Organic Compounds			
	Acetophenone	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Benzaldehyde	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Bis(2-ethylhexyl) phthalate	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Dimethyl phthalate	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Di-n-butyl phthalate	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Fluoranthene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Hexachloroethane	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Naphthalene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Phenanthrene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Pyrene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/CRQL	Reference(s)
PIT06 (0.5 ft) (Concluded)	**Polychlorinated Biphenyls**			
	Aroclor 1260	36 U µg/kg	36 µg/kg	16, pp. 91, 94, 378-417, 840; 72
SS04P1 (0.5 ft)	**Metals**			
	Beryllium	0.07 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Cadmium	0.13 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Copper	ND (0.78 mg/kg)	2.5 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Lead	24 mg/kg	1 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Manganese	0.71 U mg/kg	1.5 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Nickel	0.55 U mg/kg	4 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Vanadium	ND (2.9 mg/kg)	5 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Zinc	ND (4.4 mg/kg)	6 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Semivolatile Organic Compounds			
	Acetophenone	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 378-417, 560; 72
	Benzaldehyde	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Bis(2-ethylhexyl) phthalate	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Dimethyl phthalate	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 378-417, 560; 72
	Di-n-butyl phthalate	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 378-417, 560; 72
	Fluoranthene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Hexachloroethane	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 378-417, 560; 72
	Naphthalene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Phenanthrene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Pyrene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/CRQL	Reference(s)
SS04P1 (0.5 ft) (Concluded)	**Polychlorinated Biphenyls**			
	Aroclor 1260	37 U µg/kg	37 µg/kg	16, pp. 91, 94, 378-417, 817; 72
SS09P1 (0.5 ft)	**Metals**			
	Beryllium	0.12 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Cadmium	0.18 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Copper	2.9 U mg/kg	2.5 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Lead	58 mg/kg	1 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Manganese	4.3 U mg/kg	1.5 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Nickel	ND (2.2 mg/kg)	4 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Vanadium	5.4 mg/kg	5 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Zinc	8.5 mg/kg	6 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Semivolatile Organic Compounds			
	Acetophenone	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 569; 72
	Benzaldehyde	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 569; 72
	Bis(2-ethylhexyl) phthalate	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 569; 72
	Dimethyl phthalate	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 569; 72
	Di-n-butyl phthalate	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 569; 72
	Fluoranthene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 569; 72
	Hexachloroethane	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 569; 72
	Naphthalene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 569; 72
	Phenanthrene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 569; 72
	Pyrene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568, 569; 72
	Polychlorinated Biphenyls			
	Aroclor 1260	54 U µg/kg	54 µg/kg	16, pp. 91, 94, 410, 822; 72

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/CRQL	Reference(s)
MATRIX: Subsurface Soil				
PIT06 (3 ft)	**Metals**			
	Lead	5.4 mg/kg	1 mg/kg	16, pp. 91, 94, 378-417, 936; 25, p. 2; 71
	Manganese	4.0 mg/kg	1.5 mg/kg	16, pp. 91, 94, 378-417, 936; 25, p. 2; 71
	Vanadium	18 mg/kg	5 mg/kg	16, pp. 91, 94, 378-417, 936; 25, p. 2; 71
SB09 (3 ft)	**Metals**			
	Lead	2.2 mg/kg	1 mg/kg	16, pp. 91, 94, 410, 923; 25, p. 2; 71
	Manganese	0.96 U mg/kg	1.5 mg/kg	16, pp. 91, 94, 410, 923; 25, p. 2; 71
	Vanadium	5.1 mg/kg	5 mg/kg	16, pp. 91, 94, 410, 923; 25, p. 2; 71

Notes:

--*Indicates the background sample's analytical result was estimated (J-qualified). J-qualified RI analytical results were not used in the HRS documentation record.

CRDLS - Contract Required Detection Limit
SDL - Sample Detection Limit
SQL - Sample Quantitation Limit
CRQL - Contract Required Quantitation Limit
ft - Feet
P1 - Phase 1
SS - Surface soil
mg/kg - Milligrams per kilogram
µg/kg - Micrograms per kilogram
U - Indicates the compound/substance was analyzed for, but not detected. The associated numerical value is the SQL.
ND - Substance not detected above CRDL
( ) - Reported concentration in parentheses.

2002 Phase 2 RI Samples

In August 2002, on behalf of EPA, CDM collected a total of 32 surface soil and 26 subsurface soil samples from soil borings on RSD during Phase 2 RI sampling activities (see Figure 5) (Ref. 16, pp. 17-19, 92, 95, 180-216, 419-520). Soil borings were advanced throughout RSD, with completion of five of the borings as permanent shallow monitoring wells MW-01S through MW-05S (Ref. 16, pp. 20, 95, 122-136, 419-520). Five additional soil borings were completed as deep monitoring wells MW-01D through MW-05D and co-located with the shallow wells (Ref. 16, pp. 20, 95, 122-136, 419-520).

The concentrations of hazardous substances detected in surface and subsurface soil samples collected during the Phase 2 RI were compared to background samples collected from the soil boring completed as MW-01D. This soil boring was advanced northeast of RSD, upgradient and off site, away from RSD influences (see Figure 5) (Ref. 16, pp. 32, 85, 95, 438-444). One surface soil sample was collected from MW-01D at depth of 0.5 ft. In addition, two subsurface soil samples were collected from MW-01D at depths of 2 ft and 4 ft (Ref. 16, pp. 32, 85, 95, 438-444). MW-01D was advanced outside the test pit area in which discarded battery casings and/or landfilled waste materials were observed during the Phase 1 RI sampling activities (Ref. 16, pp. 113-120).

No additional upgradient background samples were collected during the Phase 2 RI sampling (Ref. 16, pp. 92, 95, 438-444). Consequently, in order to account for the range of naturally occurring substances, particularly metals, the analytical results of surface and subsurface soil samples collected during the Phase 2 RI were also compared to the background samples identified for the Phase 1 RI sampling. The Phase 1 RI background samples were collected from test pit six (PIT06), soil boring SS04P1, and soil boring SS09P1/SB09 (see Figure 4). Test pit six was excavated in the northeast corner of RSD, east of the birdfoot drainage canals. One surface soil sample was collected from test pit six at a depth of 0 to 0.5 ft, and one subsurface soil sample was collected from test pit six at a depth of 3 ft (Ref. 16, pp. 113-120, 378-417). Of all the text pits excavated, test pit six was located the furthest upgradient and away from the dump source (Ref. 16, pp. 84, 85, 91, 94). In addition, no discarded battery casings and/or landfilled waste materials were observed at test pit six (Ref. 16, p. 116).

Soil boring SS04P1 was located in the vicinity of the eastern power line easement, east of RSD and upgradient of the dump source (Ref. 16, pp. 91, 389, 390). One surface soil sample was collected from soil boring SS04P1 from a depth of 0.5 ft; no subsurface soil sample was collected from SS04P1 (Ref. 16, pp. 91, 389, 390). Soil boring SS09P1/SB09 was located north of the dump source, east of the birdfoot drainage canals (Ref. pp. 91, 410). One surface soil sample and one subsurface soil sample were collected from soil boring SS09P1/SB09 from depths of 0.5 ft and 3 ft, respectively (Ref. pp. 91, 410). The background soil borings were located outside the test pit area in which discarded battery casings and/or landfilled waste materials were observed (see Figure 4) (Ref. 16, pp. 113-120, 389, 390, 410).

All Phase 2 RI surface soil samples were collected from 0 to 0.5 foot below grade (Ref. 16, p. 18, 419-520). All Phase 2 RI subsurface soil samples were collected at depths ranging from 2 to 5 feet below grade (Ref. 16, pp. 19, 419-520). Several subsurface soil samples collected during the Phase 2 RI were reported to have been collected from a depth of 2 feet (Ref. 16, pp. 201-216, 419-520). However, no range of sample depths was provided for the subsurface soil samples (Ref. 16, pp. 201-216, 419-520). All soil samples reported to have been collected from a depth of 2 feet or greater are evaluated as subsurface soil samples in this HRS documentation record. Sample collection depths are presented in parentheses in the analytical data table below.

For some of the Phase 2 RI soil samples, variations in the sample identification/location numbers presented in Reference 16. In some cases, the sample collection depth was incorporated into the sample identification number listed on the chain-of-custody (COC) records or laboratory analytical data sheets presented in Reference 16. For example, for soil boring station B01, three samples were collected from the following depths: 0.5, 3.0, and 5.0 feet below grade (Ref. 16, pp. 95, 498,

501). On the COC records, the samples are listed as B-1-0, B-1-3, and B-1-5, respectively (Ref. 16, pp. 1487, 1488). However, on the laboratory analytical data sheets, the samples are listed as B10, B13, and B15, respectively (Ref. 16, pp. 996, 1138, 1139). Moreover, for duplicate samples, a number “5" is incorporated into the sample identification number. For example, a duplicate sample was collected from the 0.5-foot soil sample collected from soil boring station B07 (Ref. 16, p. 502). On the COC records, the duplicate sample is listed as B-57-0 (Ref. 16, pp. 1494, 1500). On the laboratory analytical data sheets, the duplicate sample is listed as B570 (Ref. 16, p. 1003). In the cases where sample identification numbers are significantly inconsistent, both sample identification numbers are included in the analytical data table below.

In general, Phase 2 RI surface soil samples consisted of olive gray to olive black, very fine sand with some silt. In addition, almost all the surface soil samples contained some organic material (e.g., roots) and/or minor amounts of waste materials, including battery casing pieces, concrete rubble and gravel, and/or brick material (Ref. 16, pp. 419-520). Phase 2 RI subsurface soil samples consisted primarily of olive grey to yellowish brown, very fine sand to silt, with some clay (Ref. 16, pp. 419-520).

In regards to the Phase 1 RI background samples, surface soil samples collected from test pits primarily consisted of yellowish brown, fine silty sand. A few contained olive grey to black, fine silty sand. In addition, almost all the surface soil samples collected from the test pits contained some organic material (e.g., roots) and/or minor amounts of waste materials (Ref. 16, pp. 113-120, 378-417). In general, Phase 1 RI subsurface soil samples collected from test pits consisted of yellowish brown or light olive grey fine to very fine silty sand and sandy clay. Some of the subsurface soil samples also contained organic material (e.g., roots) and/or waste materials (Ref. 16, pp. 113-120, 378-417).

Phase 1 RI surface soil samples collected from soil borings generally consisted of yellowish brown and/or olive grey, very fine to fine silty sand with some organic material and occasional waste materials (Ref. 16, pp. 378-417). The background soil samples and the soil samples from the source area were collected from similar depths, employed the same sampling method, and consisted of similar soil types (Ref. 16, pp. 41, 42, 378-417, 418-520).

The soil samples listed in the table below were collected from borings advanced in areas of contaminated soil located outside the suspected dump area (Source No. 1) (Ref. 16, pp. 91, 95, 419-520) (see Figure 5). Soil samples collected during the Phase 2 RI were analyzed by an EPA CLP laboratory; analytical data sheets are provided in Reference 16, pp. 538-953. Data validation was conducted by EPA Region 4 SESD (Refs. 16, pp. 41, 42; 73-78). The CRDLs are provided in lieu of SDLs for inorganic substances. The CRDLs are listed in Reference 25 (Ref. 25, p. 2). For organic substances, the CRQL is used instead of the SQL for samples in which the SQL is not apparent from the sample data (Ref. 26, p. 2).

Because sufficient non-qualified data are available, Phase 2 RI analytical results that were estimated (J-qualified) are not included in this HRS documentation record (Refs. 73 - 78).

Hazardous Substance	Evidence	SDL/CRDL/ SQL/CRQL	Reference(s)
MATRIX: Soil Borings - Surface Soil			
Metals			
Antimony	B08 (0.5 ft) 130 mg/kg B80	6 mg/kg	16, pp. 92, 95, 419-520, 1004, 1487-1502; 25, p. 2; 73; 75

Hazardous Substance	Evidence			SDL/CRDL/ SQL/CRQL	Reference(s)
Arsenic	B01 (0.5 ft) B10	10	mg/kg	1 mg/kg	16, pp. 92, 95, 419-520, 977-1009, 1487-1502; 25, p. 2; 73; 75
	B02 (0.5 ft) B20	2.8	mg/kg		
	B06 (0.5 ft) B60	3.6	mg/kg		
	B08 (0.5 ft) B80	16	mg/kg		
	MW04D (0.5 ft)	3.1	mg/kg		
	SS07 (0.5 ft)	5.2	mg/kg		
	SS08 (0.5 ft)	2.8	mg/kg		
	SS10 (0.5 ft)	10	mg/kg		
	SS12 (0.5 ft)	2.0	mg/kg		
	SS13 (0.5 ft)	4.1	mg/kg		
	SS513 (0.5 ft) (Dup. of SS13)	1.8	mg/kg		
	SS15 (0.5 ft)	2.0	mg/kg		
	SS16 (0.5 ft)	4.3	mg/kg		
	SS516 (0.5 ft) (Dup. of SS16)	2.2	mg/kg		
	SS17 (0.5 ft)	2.0	mg/kg		
Barium	B08 (0.5 ft) B80	62	mg/kg	20 mg/kg	16, pp. 92, 95, 419-520, 977-1009, 1487-1502; 25, p. 2; 73; 75
	MW03D (0.5 ft)	68	mg/kg		
	SS07 (0.5 ft)	73	mg/kg		
	SS10 (0.5 ft)	110	mg/kg		
	SS11 (0.5 ft)	79	mg/kg		
	SS13 (0.5 ft)	70	mg/kg		
	SS15 (0.5 ft)	84	mg/kg		
	SS16 (0.5 ft)	99	mg/kg		
Beryllium	B02 (0.5 ft) B20	1.5	mg/kg	0.5 mg/kg	16, pp. 92, 95, 419-520, 977-1009, 1487-1502; 25, p. 2; 73; 75
	B04 (0.5 ft) B40	1.4	mg/kg		
	B06 (0.5 ft) B60	1.1	mg/kg		
	MW03D (0.5 ft)	1.4	mg/kg		
	MW04D (0.5 ft)	1.4	mg/kg		
	SS07 (0.5 ft)	2.2	mg/kg		
	SS08 (0.5 ft)	1.1	mg/kg		
	SS10 (0.5 ft)	1.0	mg/kg		
	SS11 (0.5 ft)	1.7	mg/kg		
	SS13 (0.5 ft)	1.6	mg/kg		
	SS513 (0.5 ft) (Dup. of SS13)	1.2	mg/kg		
	SS16 (0.5 ft)	2.0	mg/kg		

Hazardous Substance	Evidence			SDL/CRDL/ SQL/CRQL	Reference(s)
	SS516 (0.5 ft) (Dup. of SS16)	1.3	mg/kg		
Cadmium	B01 (0.5 ft) B10	2.9	mg/kg	0.5 mg/kg	16, pp. 92, 95, 419-520, 977-1009, 1487-1502; 25, p. 2; 73; 75
	B03 (0.5 ft) B30	0.57	mg/kg		
	B06 (0.5 ft) B60	1.9	mg/kg		
	B08 (0.5 ft) B80	0.90	mg/kg		
	SS09 (0.5 ft)	1.3	mg/kg		
	SS10 (0.5 ft)	1.7	mg/kg		
	SS13 (0.5 ft)	0.53	mg/kg		
	SS16 (0.5 ft)	0.54	mg/kg		
	SS516 (0.5 ft) (Dup. of SS16)	0.55	mg/kg		
Chromium	B01 (0.5 ft) B10	28	mg/kg	1 mg/kg	16, pp. 92, 95, 419-520, 977-1009, 1487-1502; 25, p. 2; 73; 75
	B08 (0.5 ft) B80	20	mg/kg		
	SS07 (0.5 ft)	20	mg/kg		
	SS10 (0.5 ft)	22	mg/kg		
	SS13 (0.5 ft)	18	mg/kg		
	SS16 (0.5 ft)	24	mg/kg		
	SS17 (0.5 ft)	32	mg/kg		
Copper	B01 (0.5 ft) B10	14	mg/kg	2.5 mg/kg	16, pp. 92, 95, 419-520, 977-1009, 1487-1502; 25, p. 2; 73; 75
	B02 (0.5 ft) B20	82	mg/kg		
	B04 (0.5 ft) B40	90	mg/kg		
	MW04D (0.5 ft)	71	mg/kg		
	MW05D (0.5 ft)	32	mg/kg		
	SS07 (0.5 ft)	300	mg/kg		
	SS10 (0.5 ft)	29	mg/kg		
	SS513 (0.5 ft) (Dup. of SS13)	61	mg/kg		
	SS516 (0.5 ft) (Dup. of SS16)	55	mg/kg		
Manganese	B01 (0.5 ft) B10	60	mg/kg	1.5 mg/kg	16, pp. 92, 95, 419-520, 977-1009, 1487-1502; 25, p. 2; 73; 75
	B02 (0.5 ft) B20	60	mg/kg		
	B04 (0.5 ft) B40	52	mg/kg		
	B06 (0.5 ft) B60	51	mg/kg		

Hazardous Substance	Evidence			SDL/CRDL/ SQL/CRQL	Reference(s)
	B570 (Dup. of B07/B70)	18	mg/kg		
	MW04D (0.5 ft)	50	mg/kg		
	MW05D (0.5 ft)	72	mg/kg		
	SS07 (0.5 ft)	120	mg/kg		
	SS08 (0.5 ft)	44	mg/kg		
	SS09 (0.5 ft)	93	mg/kg		
	SS10 (0.5 ft)	84	mg/kg		
	SS12 (0.5 ft)	84	mg/kg		
	SS513 (0.5 ft) (Dup. of SS13)	56	mg/kg		
	SS14 (0.5 ft)	24	mg/kg		
	SS15 (0.5 ft)	66	mg/kg		
	SS516 (0.5 ft) (Dup. of SS16)	60	mg/kg		
	SS17 (0.5 ft)	1,500	mg/kg		
Nickel	B01 (0.5 ft) B10	60	mg/kg	4 mg/kg	16, pp. 92, 95, 419-520, 977-1009, 1487-1502; 25, p. 2; 73; 75
	B02 (0.5 ft) B20	20	mg/kg		
	B04 (0.5 ft) B40	20	mg/kg		
	B06 (0.5 ft) B60	13	mg/kg		
	B08 (0.5 ft) B80	13	mg/kg		
	MW03D (0.5 ft)	14	mg/kg		
	MW04D (0.5 ft)	18	mg/kg		
	SS07 (0.5 ft)	42	mg/kg		
	SS08 (0.5 ft)	13	mg/kg		
	SS11 (0.5 ft)	21	mg/kg		
	SS13 (0.5 ft)	25	mg/kg		
	SS513 (0.5 ft) (Dup. of SS13)	18	mg/kg		
	SS16 (0.5 ft)	21	mg/kg		
	SS516 (0.5 ft) (Dup. of SS16)	17	mg/kg		
Vanadium	B01 (0.5 ft) B10	44	mg/kg	5 mg/kg	16, pp. 92, 95, 419-520, 977-1009, 1487-1502; 25, p. 2; 73; 75
	B02 (0.5 ft) B20	20	mg/kg		
	B04 (0.5 ft) B40	19	mg/kg		
	B06 (0.5 ft) B60	20	mg/kg		

Hazardous Substance	Evidence			SDL/CRDL/ SQL/CRQL	Reference(s)
	B08 (0.5 ft) B80	18	mg/kg		
	MW03D (0.5 ft)	18	mg/kg		
	MW04D (0.5 ft)	18	mg/kg		
	SS07 (0.5 ft)	24	mg/kg		
	SS08 (0.5 ft)	17	mg/kg		
	SS09 (0.5 ft)	18	mg/kg		
	SS10 (0.5 ft)	30	mg/kg		
	SS11 (0.5 ft)	23	mg/kg		
	SS13 (0.5 ft)	22	mg/kg		
	SS513 (0.5 ft) (Dup. of SS13)	18	mg/kg		
	SS16 (0.5 ft)	28	mg/kg		
	SS516 (0.5 ft) (Dup. of SS16)	19	mg/kg		
	SS17 (0.5 ft)	21	mg/kg		
Semivolatile Organic Compounds					
Acetophenone	B03 (0.5 ft) B30	1,900	µg/kg	340 µg/kg	16, pp. 92, 95, 419-520, 1052, 1487-1502; 74; 76; 78
Benzo(a)anthracene	SS10 (0.5 ft)	1,200	µg/kg	430 µg/kg	16, pp. 92, 95, 419-520, 1028, 1487-1502; 74; 76; 78
Benzo(b)fluoranthene	SS10 (0.5 ft)	1,400	µg/kg	430 µg/kg	16, pp. 92, 95, 419-520, 1028, 1487-1502; 74; 76; 78
Benzo(k)fluoranthene	SS10 (0.5 ft)	1,600	µg/kg	430 µg/kg	16, pp. 92, 95, 419-520, 1028, 1487-1502; 74; 76; 78
Benzo(a)pyrene	SS10 (0.5 ft)	1,100	µg/kg	430 µg/kg	16, pp. 92, 95, 419-520, 1028, 1487-1502; 74; 76; 78
Butylbenzylphthalate	B03 (0.5 ft) B30	2,100	µg/kg	340 µg/kg	16, pp. 92, 95, 419-520, 1052, 1487-1502; 74; 76; 78
Chrysene	SS10 (0.5 ft)	2,300	µg/kg	430 µg/kg	16, pp. 92, 95, 419-520, 1028, 1487-1502; 74; 76; 78

Hazardous Substance	Evidence			SDL/CRDL/ SQL/CRQL	Reference(s)
Dimethyl phthalate	B02 (0.5 ft) B20	18,000	µg/kg	350 µg/kg	16, pp 92, 95, 419-520, 1018, 1020, 1022, 1026, 1032, 1036, 1038, 1040, 1050, 1052, 1056, 1058, 1064, 1074, 1487-1502; 74; 76; 78
	B03 (0.5 ft) B30	64,000	µg/kg	340 µg/kg	
	B05 (0.5 ft) B50	690	µg/kg	390 µg/kg	
	B06 (0.5 ft) B60	2,800	µg/kg	490 µg/kg	
	B08 (0.5 ft) B80	1,300	µg/kg	370 µg/kg	
	MW05D (0.5 ft)	3,900	µg/kg	920 µg/kg	
	SS05 (0.5 ft)	890	µg/kg	620 µg/kg	
	SS06 (0.5 ft)	1,400	µg/kg	870 µg/kg	
	SS09 (0.5 ft)	31,000	µg/kg	10,000 µg/kg	
	SS12 (0.5 ft)	94,000	µg/kg	12,000 µg/kg	
	SS14 (0.5 ft)	960	µg/kg	780 µg/kg	
	SS15 (0.5 ft)	15,000	µg/kg	10,000 µg/kg	
Fluoranthene	SS10 (0.5 ft)	4,400	µg/kg	430 µg/kg	16, pp. 92, 95, 419-520, 1028, 1487-1502; 74; 76; 78
Indeno(1,2,3-cd) pyrene	SS10 (0.5 ft)	980	µg/kg	430 µg/kg	16, pp. 92, 95, 419-520, 1028, 1487-1502; 74; 76; 78
Phenanthrene	SS10 (0.5 ft)	2,900	µg/kg	430 µg/kg	16, pp. 92, 95, 419-520, 1028, 1487-1502; 74; 76; 78
Pyrene	SS10 (0.5 ft)	3,200	µg/kg	430 µg/kg	16, pp. 92, 95, 419-520, 1028, 1487-1502; 74; 76; 78
MATRIX: Soil Borings - Subsurface Soil					
Metals					
Antimony	B06 (3 ft) B63	35	mg/kg	6 mg/kg	16, pp. 92, 95, 419-520, 1148, 1487-1502; 25, p. 2; 73; 75
Barium	B06 (3 ft) B63	60	mg/kg	20 mg/kg	16, pp. 92, 95, 419-520, 1140, 1148, 1150, 1160, 1487-1502; 25, p. 2; 73; 75
Cadmium	B03 (3 ft) B33	1.0	mg/kg	0.5 mg/kg	16, pp. 92, 95, 419-520, 1142, 1144, 1146, 1148, 1150, 1152, 1153, 1487-1502; 25, p. 2; 73; 75
	B04 (3 ft) B43	1.4	mg/kg		
	B05 (3 ft) B53	2.6	mg/kg		

Hazardous Substance	Evidence			SDL/CRDL/ SQL/CRQL	Reference(s)
	B06 (3 ft) B63	3.5	mg/kg		
	B07 (3 ft) B73	7.7	mg/kg		
	B08 (3 ft) B83	1.3	mg/kg		
	B08 (5 ft) B85	1.4	mg/kg		
	MW04D (2 ft) SBMW4D2	1.9	mg/kg		
Copper	B02 (5 ft) B25	8.3	mg/kg	2.5 mg/kg	16, pp. 92, 95, 419-520, 1140, 1141, 1148, 1149, 1150, 1487-1502; 25, p. 2; 73; 75
	B06 (3 ft) B63	11	mg/kg		
	B06 (5 ft) B65	9.4	mg/kg		
	B07 (3 ft) B73	14	mg/kg		
Manganese	B02 (3 ft) B23	44	mg/kg	1.5 mg/kg	16, pp. 92, 95, 419-520, 1140, 1148, 1150, 1487-1502; 25, p. 2; 73; 75
	B06 (3 ft) B63	48	mg/kg		
	B07 (3 ft) B73	100	mg/kg		
	MW04D (2 ft) SBMW4D2	43	mg/kg		
Nickel	B05 (3 ft) B53	13	mg/kg	6 mg/kg	16, pp. 92, 95, 419-520, 1140, 1141, 1144, 1146, 1148, 1150, 1152, 1153, 1487-1502; 25, p. 2; 73; 75
Semivolatile Organic Compounds					
Benzaldehyde	B02 (3 ft) B23	420	µg/kg	360 µg/kg	16, pp. 92, 95, 419-520, 1168, 1170, 1487-1502; 74; 76; 78
	B02 (5 ft) B25	470	µg/kg	410 µg/kg	
Benzo(a)anthracene	B06 (3 ft) B63	780	µg/kg	420 µg/kg	16, pp. 92, 95, 419-520, 1184, 1188, 1487-1502; 74; 76; 78
	B07 (3 ft) B73	1,000	µg/kg	400 µg/kg	
Benzo(b)fluoranthene	B06 (3 ft) B63	1,000	µg/kg	420 µg/kg	16, pp. 92, 95, 419-520, 1184, 1188, 1487-1502; 74; 76; 78
	B07 (3 ft) B73	1,000	µg/kg	400 µg/kg	
Benzo(k)fluoranthene	B06 (3 ft) B63	720	µg/kg	420 µg/kg	16, pp. 92, 95, 419-520, 1184, 1188, 1487-1502; 74; 76; 78
	B07 (3 ft) B73	870	µg/kg	400 µg/kg	

Hazardous Substance	Evidence			SDL/CRDL/ SQL/CRQL	Reference(s)
Benzo(a)pyrene	B06 (3 ft) B63	590	µg/kg	420 µg/kg	16, pp. 92, 95, 419-520, 1184, 1188, 1487-1502; 74; 76; 78
	B07 (3 ft) B73	640	µg/kg	400 µg/kg	
Butylbenzylphthalate	B02 (5 ft) B25	890	µg/kg	410 µg/kg	16, pp. 92, 95, 419-520, 1168, 1170, 1487-1502; 74; 76; 78
Chrysene	B06 (3 ft) B63	890	µg/kg	420 µg/kg	16, pp. 92, 95, 419-520, 1184, 1188, 1487-1502; 74; 76; 78
	B07 (3 ft) B73	1,200	µg/kg	400 µg/kg	
Dimethyl phthalate	B02 (3 ft) B23	7,000	µg/kg	360 µg/kg	16, pp. 92, 95, 419-520, 1168, 1170, 1487-1502; 74; 76; 78
	B02 (5 ft) B25	17,000	µg/kg	410 µg/kg	
Fluoranthene	B06 (3 ft) B63	1,600	µg/kg	420 µg/kg	16, pp. 92, 95, 419-520, 1184, 1186, 1188, 1487-1502; 74; 76; 78
	B06 (5 ft) B65	650	µg/kg	620 µg/kg	
	B07 (3 ft) B73	1,100	µg/kg	400 µg/kg	
Phenanthrene	B06 (3 ft) B63	1,000	µg/kg	420 µg/kg	16, pp. 92, 95, 419-520, 1184, 1487-1502; 74; 76; 78
Pyrene	B07 (3 ft) B73	1,000	µg/kg	400 µg/kg	16, pp. 92, 95, 419-520, 1188, 1487-1502; 74; 76; 78
Polychlorinated Biphenyls					
Aroclor 1254	B07 (3 ft) B73	190	µg/kg	40 µg/kg	16, pp. 92, 95, 419-520, 1236, 1487-1502; 74; 76; 78

Notes:

CRDLS - Contract Required Detection Limit
SDL - Sample Detection Limit
SQL - Sample Quantitation Limit
CRQL - Contract Required Quantitation Limit
ft - feet
SS - Surface soil
B - Boring
MW - Monitoring Well
mg/kg - Milligrams per kilogram
µg/kg - Micrograms per kilogram
Dup. - Duplicate

-Background samples - 2002 Phase 2 RI Samples

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/ CRQL	Reference(s)
MATRIX: Surface Soil				
MW01D (0.5 ft) SSMW1D	**Metals**			
	Antimony	4.8 U mg/kg	6 mg/kg	16, pp. 92, 95, 419-520, 1005, 1488; 25, p. 2
	Arsenic	0.79 U mg/kg	1 mg/kg	16, pp. 92, 95, 419-520, 1005, 1488; 25, p. 2
	Barium	ND (1.9 mg/kg)	20 mg/kg	16, pp. 92, 95, 419-520, 1005, 1488; 25, p. 2
	Beryllium	0.07 U mg/kg	0.5 mg/kg	16, pp. 92, 95, 419-520, 1005, 1488; 25, p. 2
	Cadmium	0.22 U mg/kg	0.5 mg/kg	16, pp. 92, 95, 419-520, 1005, 1488; 25, p. 2
	Chromium	ND (0.78 mg/kg)	1 mg/kg	16, pp. 92, 95, 419-520, 1005, 1488; 25, p. 2
	Copper	1.6 U mg/kg	2.5 mg/kg	16, pp. 92, 95, 419-520, 1005, 1488; 25, p. 2
	Manganese	ND (1.3 mg/kg)	1.5 mg/kg	16, pp. 92, 95, 419-520, 1005, 1488; 25, p. 2
	Nickel	ND (0.95 mg/kg)	4 mg/kg	16, pp. 92, 95, 419-520, 1005, 1488; 25, p. 2
	Vanadium	ND (1.4 mg/kg)	5 mg/kg	16, pp. 92, 95, 419-520, 1005, 1488; 25, p. 2
	Semivolatile Organic Compounds			
	Acetophenone	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78
	Benzo(a)anthracene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78
	Benzo(b) fluoranthene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78
	Benzo(k) fluoranthene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78
	Benzo(a)pyrene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78
	Chrysene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/ CRQL	Reference(s)
MW01D (0.5 ft) SSMW1D (Concluded)	Dimethyl phthalate	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78
	Fluoranthene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78
	Indeno(1,2,3-cd) pyrene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78
	Phenanthrene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78
	Pyrene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1066, 1490; 74; 76; 78
PIT06 (0.5 ft)	**Metals**			
	Antimony	--* mg/kg	6 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Arsenic	0.91 U mg/kg	1 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Barium	ND (3.8 mg/kg)	20 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Beryllium	0.04 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Cadmium	0.13 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Chromium	--*	1 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Copper	ND (1.1 mg/kg)	2.5 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Manganese	2.3 U mg/kg	1.5 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Mercury	0.05 U mg/kg	0.1 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Nickel	ND (0.51 mg/kg)	4 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Vanadium	ND (1.2 mg/kg)	5 mg/kg	16, pp. 91, 94, 378-417, 913; 25, p. 2; 71
	Semivolatile Organic Compounds			
	Acetophenone	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/ CRQL	Reference(s)
PIT06 (0.5 ft) (Concluded)	Benzo(a)anthracene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Benzo(b) fluoranthene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Benzo(k) fluoranthene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Benzo(a)pyrene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Chrysene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Dimethyl phthalate	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Fluoranthene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Indeno(1,2,3-cd) pyrene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Phenanthrene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
	Pyrene	360 U µg/kg	360 µg/kg	16, pp. 91, 94, 378-417, 604; 72
SS04P1 (0.5 ft)	**Metals**			
	Antimony	–-* mg/kg	6 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Arsenic	0.91 U mg/kg	1 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Barium	ND (2.9 mg/kg)	20 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Beryllium	0.07 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Cadmium	0.13 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Chromium	–-* mg/kg	1 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Copper	ND (0.78 mg/kg)	2.5 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Manganese	0.71 U mg/kg	1.5 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Nickel	0.55 U mg/kg	4 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Vanadium	ND (2.9 mg/kg)	5 mg/kg	16, pp. 91, 94, 389, 390, 890; 25, p. 2; 71
	Semivolatile Organic Compounds			

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/ CRQL	Reference(s)
SS04P1 (0.5 ft) (Concluded)	Acetophenone	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Benzo(a)anthracene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Benzo(b) fluoranthene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Benzo(k) fluoranthene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Benzo(a)pyrene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Butylbenzyl-phthalate	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Chrysene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Dimethyl phthalate	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Fluoranthene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Indeno(1,2,3-cd) pyrene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Phenanthrene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
	Pyrene	370 U µg/kg	370 µg/kg	16, pp. 91, 94, 389, 390, 560; 72
SS09P1 (0.5 ft)	**Metals**			
	Antimony	0.76 U mg/kg	6 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Arsenic	1.3 U mg/kg	1 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Barium	--* mg/kg	20 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Beryllium	0.12 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Cadmium	0.18 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Chromium	5.6 mg/kg	1 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Copper	2.9 U mg/kg	2.5 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Manganese	4.3 U mg/kg	1.5 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Nickel	ND (2.2 mg/kg)	4 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Vanadium	5.4 mg/kg	5 mg/kg	16, pp. 91, 94, 410, 895; 25, p. 2; 71
	Semivolatile Organic Compounds			
	Acetophenone	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72
	Benzo(a)anthracene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/ CRQL	Reference(s)
SS09P1 (0.5 ft) (Concluded)	Benzo(b) fluoranthene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72
	Benzo(k) fluoranthene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72
	Benzo(a)pyrene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72
	Butylbenzyl-phthalate	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72
	Chrysene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72
	Dimethyl phthalate	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72
	Fluoranthene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72
	Indeno(1,2,3-cd) pyrene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72
	Phenanthrene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72
	Pyrene	540 U µg/kg	540 µg/kg	16, pp. 91, 94, 410, 568; 72
MATRIX: Subsurface Soil				
MW01D (2 ft) SBMW1D2	**Metals**			
	Antimony	1.7 U mg/kg	6 mg/kg	16, pp. 92, 95, 419-520, 1154, 1488; 25, p. 2
	Barium	ND (12 mg/kg)	20 mg/kg	16, pp. 92, 95, 419-520, 1154, 1488; 25, p. 2
	Cadmium	0.23 U mg/kg	0.5 mg/kg	16, pp. 92, 95, 419-520, 1154, 1488; 25, p. 2
	Copper	0.29 U mg/kg	2.5 mg/kg	16, pp. 92, 95, 419-520, 1154, 1488; 25, p. 2
	Manganese	3.6 mg/kg	1.5 mg/kg	16, pp. 92, 95, 419-520, 1154, 1488; 25, p. 2
	Nickel	0.72 U mg/kg	4 mg/kg	16, pp. 92, 95, 419-520, 1154, 1488; 25, p. 2
	Semivolatile Organic Compounds			
	Benzaldehyde	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1490; 74; 76; 78
	Benzo(a)anthracene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1490; 74; 76; 78
	Benzo(b) fluoranthene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1490; 74; 76; 78

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/ CRQL	Reference(s)
MW01D (2 ft) SBMW1D2 (Concluded)	Benzo(k) fluoranthene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1490; 74; 76; 78
	Benzo(a)pyrene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1490; 74; 76; 78
	Butylbenzyl-phthalate	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1490; 74; 76; 78
	Chrysene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1490; 74; 76; 78
	Dimethyl phthalate	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1490; 74; 76; 78
	Fluoranthene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1490; 74; 76; 78
	Phenanthrene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1490; 74; 76; 78
	Pyrene	380 U µg/kg	380 µg/kg	16, pp. 92, 95, 419-520, 1490; 74; 76; 78
	Polychlorinated Biphenyls			
	Aroclor 1254	38 U µg/kg	38 µg/kg	16, pp. 92, 95, 419-520, 1490; 74; 76; 78
MW01D (4 ft) SBMW1D4	**Metals**			
	Antimony	1.6 U mg/kg	6 mg/kg	16, pp. 92, 95, 419-520, 1155, 1488; 25, p. 2
	Barium	ND (12 mg/kg)	20 mg/kg	16, pp. 92, 95, 419-520, 1155, 1488; 25, p. 2
	Cadmium	0.25 U mg/kg	0.5 mg/kg	16, pp. 92, 95, 419-520, 1155, 1488; 25, p. 2
	Copper	ND (1.0 mg/kg)	2.5 mg/kg	16, pp. 92, 95, 419-520, 1155, 1488; 25, p. 2
	Manganese	11 mg/kg	1.5 mg/kg	16, pp. 92, 95, 419-520, 1155, 1488; 25, p. 2
	Nickel	0.76 U mg/kg	4 mg/kg	16, pp. 92, 95, 419-520, 1155, 1488; 25, p. 2
	Semivolatile Organic Compounds			
	Benzaldehyde	420 U µg/kg	420 µg/kg	16, pp. 92, 95, 419-520, 1198, 1490; 74; 76; 78

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/ CRQL	Reference(s)
MW01D (4 ft) SBMW1D4 (Concluded)	Benzo(a)anthracene	420 U µg/kg	420 µg/kg	16, pp. 92, 95, 419-520, 1198, 1490; 74; 76; 78
	Benzo(b) fluoranthene	420 U µg/kg	420 µg/kg	16, pp. 92, 95, 419-520, 1198, 1490; 74; 76; 78
	Benzo(k) fluoranthene	420 U µg/kg	420 µg/kg	16, pp. 92, 95, 419-520, 1198, 1490; 74; 76; 78
	Benzo(a)pyrene	420 U µg/kg	420 µg/kg	16, pp. 92, 95, 419-520, 1198, 1490; 74; 76; 78
	Butylbenzyl-phthalate	420 U µg/kg	420 µg/kg	16, pp. 92, 95, 419-520, 1198, 1490; 74; 76; 78
	Chrysene	420 U µg/kg	420 µg/kg	16, pp. 92, 95, 419-520, 1198, 1490; 74; 76; 78
	Dimethyl phthalate	420 U µg/kg	420 µg/kg	16, pp. 92, 95, 419-520, 1198, 1490; 74; 76; 78
	Fluoranthene	420 U µg/kg	420 µg/kg	16, pp. 92, 95, 419-520, 1198, 1490; 74; 76; 78
	Phenanthrene	420 U µg/kg	420 µg/kg	16, pp. 92, 95, 419-520, 1198, 1490; 74; 76; 78
	Pyrene	420 U µg/kg	420 µg/kg	16, pp. 92, 95, 419-520, 1198, 1490; 74; 76; 78
	Polychlorinated Biphenyls			
	Aroclor 1254	42 U µg/kg	42 µg/kg	16, pp. 92, 95, 419-520, 1241, 1490; 74; 76; 78
PIT06 (3 ft)	**Metals**			
	Antimony	--* mg/kg	6 mg/kg	16, pp. 91, 94, 378-417, 936; 25, p. 2; 71
	Barium	ND (14 mg/kg)	20 mg/kg	16, pp. 91, 94, 378-417, 936; 25, p. 2; 71
	Cadmium	0.14 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 378-417, 936; 25, p. 2; 71
	Copper	0.17 U mg/kg	2.5 mg/kg	16, pp. 91, 94, 378-417, 936; 25, p. 2; 71
	Manganese	4.0 mg/kg	1.5 mg/kg	16, pp. 91, 94, 378-417, 936; 25, p. 2; 71
	Nickel	ND (2.9 mg/kg)	4 mg/kg	16, pp. 91, 94, 378-417, 936; 25, p. 2; 71

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/ CRQL	Reference(s)
PIT06 (3 ft) (Concluded)	**Semivolatile Organic Compounds**			
	Benzaldehyde	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651; 72
	Benzo(a)anthracene	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651; 72
	Benzo(b) fluoranthene	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651; 72
	Benzo(k) fluoranthene	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651; 72
	Benzo(a)pyrene	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651; 72
	Butylbenzyl-phthalate	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651; 72
	Chrysene	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651; 72
	Dimethyl phthalate	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651; 72
	Fluoranthene	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651; 72
	Phenanthrene	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651; 72
	Pyrene	400 U µg/kg	400 µg/kg	16, pp. 91, 94, 378-417, 651; 72
	Polychlorinated Biphenyls			
	Aroclor 1254	40 U µg/kg	40 µg/kg	16, pp. 91, 94, 378-417, 863; 72
SB09 (3 ft)	**Metals**			
	Antimony	ND (0.58 mg/kg)	6 mg/kg	16, pp. 91, 94, 410, 923; 25, p. 2; 71
	Barium	--* mg/kg	20 mg/kg	16, pp. 91, 94, 410, 923; 25, p. 2; 71
	Cadmium	0.14 U mg/kg	0.5 mg/kg	16, pp. 91, 94, 410, 923; 25, p. 2; 71
	Copper	0.62 U mg/kg	2.5 mg/kg	16, pp. 91, 94, 410, 923; 25, p. 2; 71
	Manganese	0.96 U mg/kg	1.5 mg/kg	16, pp. 91, 94, 410, 923; 25, p. 2; 71
	Nickel	ND (0.78 mg/kg)	4 mg/kg	16, pp. 91, 94, 410, 923; 25, p. 2; 71
	Semivolatile Organic Compounds			
	Benzaldehyde	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626; 72
	Benzo(a)anthracene	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626; 72
	Benzo(b) fluoranthene	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626; 72
	Benzo(k) fluoranthene	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626; 72
	Benzo(a)pyrene	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626; 72

Sample ID(s)	Hazardous Substance	Concentration	SDL/CRDL/ SQL/ CRQL	Reference(s)
SB09 (3 ft) (Concluded)	Butylbenzyl-phthalate	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626; 72
	Chrysene	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626; 72
	Dimethyl phthalate	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626; 72
	Fluoranthene	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626; 72
	Indeno(1,2,3-cd) pyrene	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626; 72
	Phenanthrene	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626; 72
	Pyrene	420 U µg/kg	420 µg/kg	16, pp. 91, 94, 410, 625, 626; 72
	Polychlorinated Biphenyls			
	Aroclor 1254	42 U µg/kg	42 µg/kg	16, pp. 91, 94, 410, 850; 72

Notes:

--*Indicates the background sample's analytical result was estimated (J-qualified). J-qualified RI analytical results were not used in the HRS documentation record.

CRDLS - Contract Required Detection Limit
SDL - Sample Detection Limit
SQL - Sample Quantitation Limit
CRQL - Contract Required Quantitation Limit
ft - Feet
SS - Surface soil
mg/kg - Milligrams per kilogram
µg/kg - Micrograms per kilogram
U - Indicates the compound/substance was analyzed for, but not detected. The associated numerical value is the SDL or SQL.
ND - Substance not detected above CRDL
( ) - Reported concentration in parentheses.

2.4.2 Hazardous Waste Quantity

2.4.2.1 Source Hazardous Waste Quantity

2.4.2.1.1 Hazardous Constituent Quantity

The amount of contaminated soil and its constituents are not known. Because the information available is insufficient to evaluate Tier A as required in Section 2.4.2.1.1 of the HRS Rule, the evaluation of HWQ proceeds to the evaluation of Tier B, Hazardous Wastestream Quantity.

2.4.2.1.2 Hazardous Wastestream Quantity

The amount of contaminated soil and its constituents are not known. Because the information available is insufficient to evaluate Tier B as required in Section 2.4.2.1.2 of the HRS Rule, the evaluation of HWQ proceeds to the evaluation of Tier C, Volume.

2.4.2.1.3 Volume

The vertical extent of soil contamination has not been determined. Because the information available is insufficient to evaluate Tier C as required in Section 2.4.2.1.3 of the HRS Rule, the evaluation of HWQ proceeds to the evaluation of Tier D, Area.

2.4.2.1.4 Area

The area of soil contamination has not been determined. Because the information available is insufficient to evaluate Tier D as required in Section 2.4.2.1.4 of the HRS Rule, the area is determined to be greater than (>) 0.

Area of source (ft^2): >0
Area Assigned Value: >0
Reference: 1, Table 2-5

2.4.2.1.5 Source Hazardous Waste Quantity Value

Source Hazardous Waste Quantity Value: >0

SITE SUMMARY OF SOURCE DESCRIPTIONS

Source Number	Source Hazardous Waste Quantity Value	Containment			
		Ground Water	Surface Water	Gas	Air Particulate
1	38.435	NS	10	NS	NS
2	>0	NS	10	NS	NS

Notes:

NS - Not scored

Reference: 1, Table 2-6

GROUND WATER MIGRATION PATHWAY

Geology and Hydrogeology

Hillsborough County is located in the Floridan section of the Atlantic Coastal Plain (Ref. 30, p. 3). RSD lies within the Gulf Coastal Lowlands, which are located between the Tampa Bay Estuaries and the Polk Uplands (Ref. 31, pp. 13, 106). RSD is underlain in descending stratigraphic order by: undifferentiated deposits; the Hawthorn Group (divided in descending order into the Bone Valley Member of the Peace River Formation, the Peace River Formation, and the Arcadia Formation); the Tampa Limestone; the Suwannee Limestone; the Ocala Group; and the Avon Park Formation (Refs. 32, pp. 12-13; 33, pp. 55-56).

Ground water is the principal source of potable water for domestic, agricultural, and industrial supplies in Hillsborough County (Ref. 31, p. 125). The ground water system in the vicinity of RSD is divided into three distinct systems, the surficial aquifer, the intermediate confining layer, and the Floridan aquifer (Ref. 31, pp. 1, 14, 17, 18).

The surficial aquifer system in Hillsborough County is composed of the undifferentiated deposits (Ref. 31, p. 18; 32, pp. 12-13). The aquifer is approximately 20 feet thick in the vicinity of RSD (Refs. 16, pp. 121-136; 32, pp. 12-13). The water table in the surficial aquifer generally follows the topographic relief with flow patterns, usually local in nature, following the surface water basins (Refs. 31, pp. 6-8, 127 ; 32, p. 28). The surficial aquifer supplies the least amount of water in the county (Ref. 31, p. 128). Small volumes of water are used for domestic use, lawn irrigation, or stock watering (Ref. 31, p. 128).

The intermediate confining layer is composed of the Bone Valley Member and the Peace River Formation of the Hawthorn Group, with the Arcadia Formation forming the base (Ref. 31, pp. 14, 17, 113). South of RSD, the Hawthorn Group comprises an intermediate aquifer system; however, the intermediate aquifer is not present beneath RSD (Refs. 16, pp. 54, 55, 121-136; 31, pp. 14, 17, 18). In the vicinity of RSD, the Hawthorn Group serves as a confining layer between the surficial aquifer and the Floridan aquifer. This confining layer retards vertical movement of ground water between the overlying surficial aquifer and the underlying Floridan aquifer (Ref. 31, pp. 17, 18).

The Upper Floridan aquifer is the principal source of ground water in Hillsborough County (Ref. 31, pp. 6, 14, 129). The aquifer includes the Arcadia Formation and the Tampa Member of the Hawthorn Group, the Suwannee Limestone, the Ocala Group and the Avon Park Formation (Ref. 31, p. 114, 129). Well yields vary from less than 500 gallons per minute to greater than 5,000 gallons per minute (Ref. 31, p. 129). Well depths are generally less than 700 feet, primarily due to poor water quality at greater depth (Ref. 31, pp. 20, 130). The ground water flow within the Floridan aquifer in Hillsborough County is generally toward the southwest (Refs. 31, pp. 6-8, 132; 32, p. 28).

Ground Water Sampling

In August 1998, as part of the RSD ESI and on behalf of EPA, TT-EMI START collected eight ground water samples, including one duplicate, from seven temporary well points (RSDS-01-GW through RSDS-05-GW, RSDS-07-GW, and RSDS-08-GW) advanced in the surficial aquifer (see Figure 3 of this HRS documentation record for ESI ground water sample locations) (Refs. 7, pp. 11, 13, 15, 17-19; 9, pp. 10, 18, 29, 31). The wells were screened between approximately 5 and 8 ft below ground surface (Refs. 7, pp. 11, 13, 15, 17-19; 9, p. 31). Analytical results indicated a release of hazardous substances, including lead, manganese, zinc, and methyl ethyl ketone (MEK) (Ref. 9, Appendix A - pp. 119, 126, 170, 172, 173).

In August 2002, as part of the Phase 2 RI and on behalf of EPA, CDM advanced soil borings throughout RSD (Ref. 16, pp. 17-19, 92, 95, 180-216, 419-520). Five borings were completed as permanent shallow ground water monitoring wells MW-01S through MW-05S, and five borings were completed as deep ground water monitoring wells MW-01D through MW-05D and co-located with the shallow wells (see Figure 6 of this HRS documentation record for RI ground water well locations) (Ref. 16, pp. 20, 95, 122-136,

419-520). Shallow wells were screened at intervals between approximately 2 and 15 ft below the top of the well casing. Deep wells were screened at intervals between about 36 to 47 ft below the top of the well casing (Ref. 16, pp. 122-136). CDM collected ground water samples from the permanent wells, as well from private water supply wells located at Tampa Fiberglass and D&B Construction Services (Ref. 16, p. 20). The water from the private wells is too salty to drink and are currently used for sanitary purposes only (toilets, hand washing, etc.) (Ref. 16, p. 20). Based on the analytical results of permanent monitor well samples, a release of antimony, arsenic, and manganese to the surficial aquifer occurred ; no evidence of a release to the intermediate aquifer was indicated (Ref. 16, pp. 86-89, 419-520, 1384, 1386, 1388, 1391).

In March 2006, as part of the Supplemental RI and on behalf of EPA, Black & Veatch collected ground water samples from the 10 permanent monitoring wells (MW-01S through MW-05S and MW-01D through MW-05D) on RSD (Ref. 16, pp. 17-21, 247-270, 521-537). The samples were analyzed for total and dissolved metals (Ref. 16, p. 21). Analytical results indicated a release of antimony and lead in MW-04S (16, pp. 86-89, 521-537, 1510, 1511).

According to the Black & Veatch Final RI Report, metals detected in ground water samples collected during the RI that exceeded EPA Maximum Contaminant Levels (MCLs) included antimony, arsenic, cadmium, lead, and thallium. These metals were detected in monitoring wells MW-2S and MW-4S; arsenic was detected in MW-5S (Ref. 16, p. 37).

Ground Water Targets

The nearest active public drinking water ground water supply system is operated by Southern Winding Service, Inc., located approximately 0.9 miles east-northeast of the RSD property (see Figure 1) (Refs. 3, pp. 1, 2; 37, pp. 8-9). According to EPA's Safe Drinking Water Information System (SDWIS) database and FDEP's Source Water Assessment and Protection Program (SWAPP) database, the Southern Winding Service system is a non-transient, non-community water system (Refs. 38, p. 16; 39, pp. 5, 7, 8). A non-transient, non-community water system is defined as a public water system that regularly serves at least 25 of the same persons for 6 months or more each (e.g., offices, schools, day care centers, nursing homes, factories, etc,) (Ref. 39, p. 7). According to the EPA SDWIS and FDEP SWAPP databases, the system serves 34 persons and consists of one well screened in the Floridan aquifer (Refs. 38, p. 16; 39, pp. 5, 7, 8).

One additional active non-transient, non-community ground water drinking water supply system, Tampa Amalgamated Steel Corp., is located within 4 radial miles of the RSD property (Refs. 3, pp. 1, 2; 37, pp. 8-9). According to EPA's SDWIS database and FDEP's SWAPP database, the Tampa Amalgamated Steel Corp. utilizes one well screened in the Floridan aquifer and serves 45 persons (Refs. 37, pp. 8-9; 38, p. 16; 39, pp. 5, 7, 9). The well is located approximately 1.5 miles east of the RSD property (Refs. 3, pp. 1, 2).

A total of 11 active transient, non-community ground water drinking water supply systems are located within 4 radial miles of the RSD property (Refs. (Refs. 3, pp. 1, 2; 37, pp. 8-9; 38, pp. 23-32; 39, pp. 10-19). A transient, non-community water system is defined as a public water system which that does not regularly serve the same people, but serves at least 25 people for more than 6 months of the year (i.e., such as those serving traveling patrons of restaurants, motels, churches, or parks) (Ref. 39, p. 7). The nearest of these systems, Lamb of God Church, is located 1.25 miles east-northeast of the RSD property (Refs. 3, pp. 1, 2; 37, pp. 8-9). In accordance with Section 3.3.2 of the HRS Rule, transient populations served by drinking water systems are excluded from this HRS documentation record (Ref. 23, p. 51603).

No active community drinking water ground water systems are located with 4 radial miles of the RSD property (Refs. 3, pp. 1, 2; 38, pp. 8-9). A community water system is a public water system that serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents. Community water systems range in size from small mobile home parks/courts to large city utilities (Ref. 39, p. 7). Previous investigations of the RSD property reported the existence of community drinking water ground water systems within 4 radial miles of the RSD property

(Ref. 9, p. 10, 30). However, these systems are now closed or inactive (Refs. 40; 41, p. 1). Populations previously served by these closed/inactive systems now purchase their drinking water from surface water sources not located along the 15-mile downstream surface water pathway for the RSD property (Refs. 38, p. 3; 40; 41 p. 1).

Portions of Hillsborough County are also served by Tampa Bay Water, a wholesale water supplier (42, pp. 1, 2). Tampa Bay Water obtains their water from a variety of wellfields and surface water intakes and supplies the water to the municipalities/utilities of Hillsborough County, Pasco County, Pinellas County, St. Petersburg, New Port Richey, and Tampa. These member utilities, in turn, provide water to more than 2 million people in the tri-county area (Ref. 42, pp. 1, 2). None of Tampa Bay Water's sources of drinking water are located within 4 radial miles or along the 15-mile downstream surface water pathway of the RSD property (Refs. 37, pp. 1-9; 42, p. 2).

The estimated HRS-eligible population served by non-transient non-community public drinking water supply wells within 4 radial miles of the property is 79 persons, and the population distribution served by these wells within the target distance limit is as follows: 0 to 0.25 miles, 0 persons; 0.25 to 0.5 miles, 0 persons; 0.5 to 1 mile, 34 persons; 1 to 2 miles, 45 persons; 2 to 3 miles, 0 persons; 3 to 4 miles, 0 persons (Refs. 3, pp. 1, 2; 37, pp. 8-9; 38, p. 16; 39, pp. 5, 7, 8-9; 40; 41, p. 1). Transient non-community water supply systems were not included in this estimated population.

The exact location of the nearest private (i.e., residential/domestic) drinking water supply well could not be determined. Private ground water supplies located within 4-radial miles of the property were estimated using equal distribution calculations of U.S. Census CENTRACTS data identifying population, households, and private water wells for "Block Groups" which lie within or partially within individual radial distance rings measured from the RSD property (Ref. 43, p. 1). The CENTRACTS report used 1990 census data (Ref. 43, p. 1). It is likely, based on the increased population in Hillsborough County as documented by 2000 census data, that the CENTRACTS report underestimates the private well populations (Refs. 43, pp. 1, 20-22; 44, pp. 2, 4). The nearest private drinking water supply well is estimated to be located within 0.25-radial miles from the property (Ref. 43, p. 22). This estimate agrees with the January 20, 2006 ATSDR Public Health Assessment Report on RSD. ATSDR reported that a single-family residential property located approximately 0.25 miles southeast of the RSD site does not have a municipal water meter, indicating the property is served by a private well (Ref. 21, pp. 5, 27-28). Therefore, this residence is assumed to be the location of the nearest private drinking water supply well. Moreover, based on Reference 43, the well serving this residence is assumed to serve at least 1 person (Ref. 43, p. 22).

The total estimated population served by private ground water drinking water supply wells within 4 radial miles of the property is 3,351 persons, and the population distribution served by private wells is as follows: 1 person from 0 to 0.25 mile; 3 persons from 0.25 to 0.50 mile; 180 persons from 0.50 to 1 mile; 656 persons from 1 to 2 miles; 1,368 persons from 2 to 3 miles; and 1,143 persons from 3 to 4 miles (Ref. 43, pp. 20-22). Furthermore, based on available information, all private wells are assumed to be completed in the Floridan aquifer (Refs. 21, p. 5; 45).

Because evidence of a release to ground water at the RSD site, the ground water pathway is a concern to EPA; however, this pathway does not significantly contribute to the site score.

4.1 OVERLAND/FLOOD MIGRATION COMPONENT

4.1.1.1 Definition of Hazardous Substance Migration Path for Overland/Flood Component

RSD is located in the Alafia River River Drainage Basin (Ref. 62). The property is located within the 100-year flood zone of Delaney Creek (Ref. 61). Elevation across RSD ranges from about 2 to 7 feet above mean sea level (Refs. 3, pp. 1, 2; 6, p. 2; 16, p. 85).

HRS-qualified wetland areas are located throughout the birdfoot drainage canals, adjacent to the northern and northwestern portions of RSD, as well as south of RSD, contiguous with Delaney Creek (Refs. 16, pp. 158; 18, pp. 1-4; 63). Prior to dumping of fill material and regrading of the site, almost the entire area of the RSD property contained wetlands (Refs., 8, pp. 10-16; 16, pp. 139, 140, 143, 144, 158; 18, pp. 1-4, Attachment 2; 63). The point where the dump extends into the birdfoot drainage canals and the contiguous wetland area is probable point of entry (PPE) No. 1. From PPE No. 1, the birdfoot drainage canals carry surface water northwesterly for approximately 350 ft before discharging into a larger canal, referred to as the western drainage canal and located west of RSD. The western drainage canal flows southerly for approximately 1,100 ft before flowing into Delaney Creek (see Figures 1 and 5 of this HRS documentation record) (Refs. 3, pp. 1-3; 8, p. 23; 9, p. 10; 15, p. 21; 16, 85). Stormwater runoff in the southeastern portion of RSD, in the vicinity of Tampa Fiberglass operations, flows east and enters a drainage swale that parallels the eastern power line easement (Refs. 10, pp. 1, 21; 15, p. 21; 16, p. 85). The drainage swale flows south and discharges into the needle rush marsh at a point southeast of the RSD property (PPE No. 2) (see Figures 1 and 5 of this HRS documentation record). Storm water runoff on the southwestern portion of the RSD property enters the needle rush marsh via overland flow, at a point southwest of the RSD property (PPE No. 3) (see Figures 1 and 5 of this HRS documentation record). No known stormwater drains or catchbasins are located on the property. South of the property, the needle rush marsh is contiguous with Delaney Creek (Refs. 3, pp. 1, 2; 9, p. 10; 10, pp. 1, 21; 15, p. 21; 16, p. 85; 18, pp. 1-4, Attachment 2). The wetlands documented in the vicinity of RSD are considered HRS-eligible surface water bodies pursuant to Reference 1, Section 4.0.2 (18, pp. 1-4, Attachment 2; 63).

PPE No. 2 is the furthest upstream PPE on Delaney Creek. PPE No. 2 is located approximately 600 feet upstream of PPE No. 3, the furthest downstream PPE (see Figures 1 and 5 of this HRS documentation record) (Refs. 3, pp. 1, 2, 3). The western drainage canal flows into Delaney Creek approximately 600 feet downstream of PPE No. 3 and approximately 1,000 feet downstream of PPE No. 1 (Refs. 3, pp. 1, 2; 9, p. 10). Since PPE No. 3 is the furthest downstream PPE, the 15-mile surface water migration pathway is calculated from this point (Ref. 3, pp. 1-3). From PPE No. 3, Delaney Creek flows southwesterly for approximately 1 mile before entering East Bay. East Bay carries surface water for approximately 1 mile and flows into Hillsborough Bay, which, in turn, flows for approximately 6 miles before entering Tampa Bay. Tampa Bay makes up the remaining 7 miles of the 15-mile downstream target distance limit (TDL). The 15-mile downstream surface water pathway terminus occurs as an arc in Tampa Bay, with the southern end of the arc located in the vicinity of Cockroach Bay and the mouth of the Little Manatee River, and the northern end of the arc located in the vicinity of the Gandy Bridge and the Interbay Peninsula (Ref. 3, pp. 1-3).

Delaney Creek and the western drainage canal are perennially flowing surface water bodies (Ref. 3, pp. 1, 2, 3). Therefore, pursuant to Section 4.0.2 of the HRS Rule, Delaney Creek and the western drainage canal are considered rivers (1, p. 51605). Delaney Creek, the western drainage canal, and the birdfoot drainage canals are tidally influenced surface water bodies (Refs. 6, p. 7; 15, p. 21; 16, pp. 11, 144, 145). The upstream extent of tidal influence on the western drainage canal is not available. Delaney Creek is usually brackish downstream of U.S. Highway 41, which is located approximately 0.65 miles upstream of RSD (Refs. 3, pp. 1, 2; 15, p. 21; 49, p. 12). Previous upstream sediment and surface water samples collected from the western drainage canal and Delaney Creek do not indicate contaminants are migrating upstream via tides (Refs. 7; 9; 16; 24). Therefore, since there is no documentation to suggest that the tidal run has carried hazardous substances from the site to upstream targets,

the tidal influence was not taken into consideration when establishing the target distance limit of the surface water migration pathway (Ref. 1, Section 4.1.1.2). Moreover, inclusion of upstream targets would not change the overall site score.

The surface water pathway was evaluated on the basis of an observed release to the needle rush marsh wetlands contiguous with Delaney Creek and to the birdfoot drainage canals, which contain wetlands and a documented habitat for an endangered species (Refs. 12; 18). Contaminants detected in surface water and sediment samples collected from the birdfoot drainage canals, the western drainage canal, and Delaney Creek, including the needle rush marsh, include arsenic, barium, chromium, copper, lead, manganese, mercury, nickel, vanadium, and zinc (Refs. 9; 16).

4.1.2.1 LIKELIHOOD OF RELEASE

4.1.2.1.1 Observed Release

Direct Observation

RSD was previously used by Chloride Metals for the disposal of fill material containing battery casings, smelter slag, and miscellaneous debris (Refs. 4, pp. 1, 3; 5, pp. 1, 4, 5, 15, 17, 24; 6, p. 3). "Midnight dumping" of various other waste materials, including construction and demolition debris, by unknown persons also occurred on the RSD property (Refs. 4, p. 3; 5, p. 3; 7, p. 15). The owner of the RSD property at the time of dumping reportedly allowed dumping and used a bulldozer to spread the material over low-lying (wetland) areas and to keep the material away from the road (Ref. 4, p. 3).

On several occasions, visible evidence of dumping has been documented through the presence of battery casings, concrete debris, and tires on land surface and in debris piles located throughout the property (Ref. 7, pp. 13, 15-16, 18-19). In 1993, FDEP noted battery casing and debris piles on the northern portion of RSD, adjacent to the birdfoot drainage canals and the associated marsh area (Ref. 10, pp. 1, 21). During the ESI and RI field investigations, evidence of battery casing disposal and debris piles (i.e., Source No. 1) was recorded in the field logbooks (Refs. 7, pp. 12, 15-16, 18-19; 16, pp. 378-537).

According to the 1994 SI, a sinkhole on the property may have originally been filled with the dumped material (Ref. 15, p. 4). Prior to dumping, based on historical aerial photographs and a USGS topographic map, some of the birdfoot drainage canals extended into the southern portion of the property (Refs. 3, pp. 1, 2; 8, pp. 13-23; 16, p. 159). Prior to the dumping and regrading of the site, almost the entire area of the RSD property contained wetlands (Refs, 16, pp. 139, 140, 143, 144, 158; 18, pp. 1-4, Attachment 2; 63). Portions of the drainage canals and surrounding wetlands have been filled by dumping, and some of the waste piles in the northern portion of RSD are surrounded by water (Refs. 12, p. 1; 16, pp. 143-145). Currently, the upper birdfoot drainage canals form the northwestern border of the northern portion of the dump; tributaries of the birdfoot drainage canals are located throughout the northern portion of the property (Refs. 9, p. 4; 12, p. 1). The area where dumping occurred is generally inundated with water, to the extent that the wetlands comprising the northern boundary of the property have been altered by placement of the dumped material (Ref. 12, p. 1). Islands of dumped material are reportedly surrounded by wetlands (Ref. 12, p. 1). These wetlands drain directly into the birdfoot drainage canals and follow the surface water pathway (Refs. 3, pp. 1-3; 18, pp. 1-4, Attachment 2; 63).

Hazardous substances commonly associated with the wastes generated by battery reclamation facilities, such as discarded battery casings, include arsenic, cadmium, copper, chromium, lead, mercury, nickel, and zinc (Refs. 55, p. 1; 56). During the Phase 1 RI conducted on behalf of EPA, CDM collected soil samples from test pits excavated within the wetland area in Source No. 1, including PIT08, PIT09, and PIT14 (see Figure 4) (Ref. 16, pp. 17-19, 91, 94, 113-120, 180-216, 378-417). In addition, CDM collected soil samples from soil borings SS06P1, and SS07P1, which were located in the wetland area within Source No. 1 (see Figure 4) (Ref. 16, pp. 17-19, 91, 94, 113-

120, 180-216, 378-417). Analytical results of these soil samples revealed the presence of cadmium, copper, lead, manganese, nickel, and zinc at elevated concentrations (Ref. 16, pp. 886-921). Since Source No. 1 is essentially a filled wetland, and since existing wetlands (birdfoot drainage canals) directly abut the source, an observed release to the surface water pathway by direct observation has been documented.

Chemical Analysis

1998 ESI Samples

- Background Samples - Canals

Between August 25-27, 1998, as part of the ESI and on behalf of EPA, TT-EMI START personnel collected background surface water and sediment samples from the western drainage canal (Refs. 7; 9, pp. 1, 10, 14-17; 24; 68, pp. 1-22). Surface water sample RSDS-05-SW and sediment sample RSDS-05-SD were collected from the western drainage canal, north (upstream) of its confluence with the birdfoot drainage canals (Ref. 7, pp. 7-8; 9, pp. 10, 14, 16). These samples, therefore, represent surface water and sediment unaffected by runoff from the dump. Sample locations are depicted in Figure 3 of this HRS documentation record. Also, refer to the sample location summary tables presented in Reference 9.

All surface water samples were collected from between 0 to 2 inches below the water surface (Ref. 47). Water quality parameters, including temperature, conductivity, pH, and turbidity, were recorded at each surface water sampling location (Ref. 7, pp. 4-9). Ranges of each parameter were as follows: 27.2 degrees Celsius (°C) to 40.4 °C, for temperature; 4.31 microsiemens per centimeter (µS/cm) to 19.4 µS/cm, for conductivity; 6.20 to 7.13 standard pH units, for pH; and 3.56 nephelometric turbidity units (NTU) to 38.6 NTU, for turbidity (Ref. 7, pp. 4-9).

All sediment samples were collected from a depth of 0 to 3 inches (Ref. 7, pp. 1-9). In general, the sediment samples contained dark charcoal grey to black, sand, silt, and clay materials with some decaying organic matter(Ref. 7, pp. 4-9).

Background sediment and surface water samples were collected from similar depths, employed the same sampling methods, consisted of similar physical and chemical attributes, and were collected during the same sampling event (Ref. 7, pp. 1-9; 9, Appendix A; 47). The following table summarizes the background samples collected from the western drainage canal by TT-EMI START in August 1998.

Sample ID	Sample Source	Sample Depth (Inches)	Date/ Time (hrs) Collected	Reference(s)
MATRIX: Surface Water				
RSDS-05-SW	Sample collected from the western drainage canal, upstream (north) of its confluence with birdfoot drainage canals, in order to establish reference concentrations for surface water sample comparisons. temperature = 33.9 °C conductivity = 4.7 µS/cm pH = 6.81 turbidity = 11.1 NTU	0 to 2	08/26/98 1535	7, pp. 7, 8; 9, pp. 10, 14, Appendix B; 24, p. 8; 47; 68, pp. 8, 21

1998 ESI Samples (Continued)

Sample ID	Sample Source	Sample Depth (Inches)	Date/ Time (hrs) Collected	Reference(s)
RSDS-05-SW (Duplicate)	Duplicate of surface water sample RSDS-05-SW, collected for quality control.	0 to 2	08/26/98 1535	7, pp. 7, 8; 9, pp. 10, 14, Appendix B; 24, p. 8; 47; 68, pp. 7, 8, 21
MATRIX: Sediment				
RSDS-05-SD	Sample co-located with RSDS-05-SW, in order to establish reference concentrations for sediment sample comparisons. Material was somewhat sandy, coarse grained for the first inch, after which material was darker and more silty. Sample may have contained biological organisms (e.g., snails).	0 to 3	08/26/98 1545	7, pp. 7, 8; 9, pp. 10, 16, Appendix B; 24, p. 6; 68, pp. 4, 16

Notes:

RSDS - Raleigh Street Dump Site
SW - Surface Water
SD - Sediment
µS/cm - Microsiemens per centimeter
°C - Degrees Celsius
NTU - Nephelometric Turbidity Unit
hrs - Hours

- Background Sample Analytical Concentrations - Canals

Samples were analyzed by an EPA CLP laboratory; analytical data sheets are provided in Reference 9, Appendix A. Background samples were collected upgradient and off site, away from RSD influences. No other facility is between the background sampling location and the RSD property (Refs. 1, pp. 1-3; 9, pp. 10, 14-17). Data validation was conducted by the EPA Region 4 SESD (Refs. 9, Appendix A; 69; 70). The CRDLs are provided in lieu of SDLs for inorganic substances. The CRDLs are listed in Reference 25 (Ref. 25, p. 2). For organic substances, the CRQL is used instead of the SQL for samples in which the SQL is not apparent from the sample data (Ref. 26, p. 2).

Sample ID	Hazardous Substance	Concentration	SDL/CRDL/ SQL	Reference(s)
MATRIX: Surface Water				
RSDS-05-SW	Arsenic	8 U µg/L	10 µg/L	7, pp. 7, 8; 9, Appendix A - p. 160; 24, p. 8; 25, p. 2; 68, pp. 8, 21; 69
	Lead	ND (7 µg/L)	10 µg/L	7, pp. 7, 8; 9, Appendix A - p. 160; 24, p. 8; 25, p. 2; 68, pp. 8, 21; 69
	Manganese	21 µg/L	15 µg/L	7, pp. 7, 8; 9, Appendix A - p. 160; 24, p. 8; 25, p. 2; 68, pp. 8, 21; 69
RSDS-05-SW (Duplicate)	Arsenic	5 U µg/L	10 µg/L	7, pp. 7, 8; 9, Appendix A - p. 160; 24, p. 8; 25, p. 2; 68, pp. 7, 8,; 69 21

1998 ESI Samples (Continued)

Sample ID	Hazardous Substance	Concentration	SDL/CRDL/ SQL	Reference(s)
	Lead	ND (7 µg/L)	10 µg/L	7, pp. 7, 8; 9, Appendix A - p. 160; 24, p. 8; 25, p. 2; 68, pp. 7, 8, 21; 69
	Manganese	21 µg/L	15 µg/L	7, pp. 7, 8; 9, Appendix A - p. 160; 24, p. 8; 25, p. 2; 68, pp. 7, 8, 21; 69
MATRIX: Sediment				
RSDS-05-SD	Arsenic	2 U mg/kg	1 mg/kg	7, pp. 7, 8; 9, Appendix A - p. 184; 24, p. 6; 25, p. 2; 68, pp. 4, 16; 69
	Barium	ND (7.6 mg/kg)	20 mg/kg	7, pp. 7, 8; 9, Appendix A - p. 184; 24, p. 6; 25, p. 2; 68, pp. 4, 16; 69
	Chromium	3.5 mg/kg	1 mg/kg	7, pp. 7, 8; 9, Appendix A - p. 184; 24, p. 6; 25, p. 2; 68, pp. 4, 16; 69
	Copper	5.86 J* mg/kg (4.8 J mg/kg)	2.5 mg/kg	7, pp. 7, 8; 9, Appendix A - p. 184; 24, p. 6; 25, p. 2; 27, p. 2; 68, pp. 4, 16; 69
	Lead	28 mg/kg	1 mg/kg	7, pp. 7, 8; 9, Appendix A - p. 184; 24, p. 6; 25, p. 2; 68, pp. 4, 16; 69
	Manganese	8.3 mg/kg	1.5 mg/kg	7, pp. 7, 8; 9, Appendix A - p. 184; 24, p. 6; 25, p. 2; 68, pp. 4, 16; 69
	Mercury	0.15 U mg/kg	0.1 mg/kg	7, pp. 7, 8; 9, Appendix A - p. 184; 24, p. 6; 25, p. 2; 68, pp. 4, 16; 69
	Zinc	20 U mg/kg	6 mg/kg	7, pp. 7, 8; 9, Appendix A - p. 184; 24, p. 6; 25, p. 2; 68, pp. 4, 16; 69

Notes:

The original concentration for adjusted J-qualified (estimated) analytical results is presented in parentheses.

CRDLS - Contract Required Detection Limit
SDL - Sample Detection Limit
SQL - Sample Quantitation Limit
RSDS - Raleigh Street Dump Site
SW - Surface water
µg/L - Micrograms per liter
SD - Sediment
mg/kg - Milligrams per kilogram
µg/kg - Micrograms per kilogram
J* - Estimated concentration adjusted in accordance with Reference 28 (see Reference 27).
U - Indicates the compound/substance was analyzed for, but not detected. The associated numerical value is the SQL or SDL.
ND - Substance not detected above CRDL
( ) - Reported concentration in parentheses.

1998 ESI Samples (Continued)

- Contaminated Samples - Canals

Between August 25-27, 1998, as part of the ESI and on behalf of EPA, TT-EMI START personnel collected surface water and sediment samples from the birdfoot drainage canals and the western drainage canal (Refs. 7; 9, pp. 1, 10, 14-17; 24; 68, pp. 1-22). All surface water samples were collected from between 0 to 2 inches below the water surface (Ref. 47). All sediment samples were collected from a depth of 0 to 3 inches (Ref. 7, pp. 1-9). Sample locations are depicted in Figure 3 this HRS documentation record. Also, refer to the sample location summary tables presented in Reference 9. The following table summarizes the surface water and sediment samples collected from the birdfoot drainage canals and the western drainage canal by TT-EMI START in August 1998.

Sample ID	Sample Source	Sample Depth (Inches)	Date/ Time (hrs) Collected	Reference(s)
MATRIX: Surface Water				
RSDS-01-SW	Sample collected from the northern tributary of the birdfoot drainage canals, adjacent to dump, in order to establish potential impact on targets along the downstream pathway. temperature = 37.0 °C conductivity = 6.45 µS/cm pH = 6.69 turbidity = 4.96 NTU	0 to 2	08/25/98 1540	7, pp. 4, 5; 9, pp. 10, 14, Appendix B; 24, p. 5; 47; 68, pp. 1, 2, 11
RSDS-02-SW	Sample collected from the western tributary of the birdfoot drainage canals, adjacent to dump, in order to establish potential impact on targets along the downstream pathway. temperature = 40.4 °C conductivity = 10.2 µS/cm pH = 7.13 turbidity = not available	0 to 2	08/25/98 1505	7, p. 4; 9, pp. 10, 14, Appendix B; 24, p. 5; 47; 68, pp. 1, 11
RSDS-03-SW	Sample collected from the central tributary of the birdfoot drainage canals, adjacent to dump, in order to establish potential impact on targets along the downstream pathway. temperature = 29.4 °C conductivity = 19.4 µS/cm pH = 6.20 turbidity = 8.40 NTU	0 to 2	08/27/98 0850	7, p. 9; 9, pp. 10, 14, Appendix B; 24, p. 8; 47; 68, pp. 6, 21
RSDS-04-SW	Sample collected from the confluence of the western drainage canal and the birdfoot drainage canals, in order to establish potential impact on targets along the downstream pathway. temperature = 33.1 °C conductivity = 12.5 µS/cm pH = 7.02 turbidity = 3.56 NTU	0 to 2	08/26/98 1630	7, p. 8; 9, pp. 10, 14, Appendix B; 24, p. 8; 47; 68, pp. 8, 20

1998 ESI Samples (Continued)

Sample ID	Sample Source	Sample Depth (Inches)	Date/ Time (hrs) Collected	Reference(s)
RSDS-06-SW	Sample collected from the western drainage canal, downstream of its confluence with the birdfoot drainage canals, in order to establish potential impact on targets along the downstream pathway. temperature = 27.2 °C conductivity = 4.31 µS/cm pH = 6.44 turbidity = 38.6 NTU	0 to 2	8/25/98 1150	7, p. 4; 9, pp. 10, 14, Appendix B; 24, p. 4; 47; 68, pp. 2, 11
MATRIX: Sediment				
RSDS-01-SD	Sample co-located with RSDS-01-SW, in order to establish potential impact on targets along the downstream pathway. Description of sample material not available.	0 to 3	08/25/98 1555	7, pp. 4, 5; 9, pp. 10, 16, Appendix B; 24, p. 5; 68, pp. 2, 11
RSDS-02-SD	Sample co-located with RSDS-02-SW, in order to establish potential impact on targets along the downstream pathway. Material was dark, charcoal grey, sandy silty, high moisture content. Strong odor of decaying organic matter.	0 to 3	08/25/98 1520	7, p. 4; 9, pp. 10, 16, Appendix B; 24, p. 5; 68, pp. 3, 11
RSDS-03-SD	Sample co-located with RSDS-03-SW, in order to establish potential impact on targets along the downstream pathway. Material was dark, charcoal grey to black, silty and sandy. Strong odor of decaying organic matter.	0 to 3	08/27/98 0900	7, p. 9; 9, pp. 10, 16, Appendix B; 24, p. 9; 68, pp. 4, 15
RSDS-04-SD	Sample co-located with RSDS-04-SW, in order to establish potential impact on targets along the downstream pathway. Material was dark charcoal, clayey silty and somewhat clayey.	0 to 3	08/26/98 1635	7, p. 8; 9, pp. 10, 16, Appendix B; 68, pp. 4, 16
RSDS-06-SD	Sample co-located with RSDS-06-SW, in order to establish potential impact on targets along the downstream pathway. Material was dark charcoal grey, sandy and somewhat clayey, and very high moisture content. Strong odor of decaying organic matter.	0 to 3	08/25/98 1200	7, p. 4; 9, pp. 10, 16, Appendix B; 24, p. 4; 68, pp. 4, 13

Notes:

RSDS - Raleigh Street Dump Site
SW - Surface Water
SD - Sediment
µS/cm - Microsiemens per centimeter
°C - Degrees Celsius
NTU - Nephelometric Turbidity Unit
hrs - Hours

1998 ESI Samples (Continued)
- Contaminated Samples Analytical Concentrations - Canals

Samples were analyzed by an EPA CLP laboratory; analytical data sheets are provided in Reference 9, Appendix A. Data validation was conducted by EPA Region 4 SESD (Refs. 9, Appendix A; 69; 70). The CRDLs are provided in lieu of SDLs for inorganic substances. The CRDLs are listed in Reference 25 (Ref. 25, p. 2). For organic substances, the CRQL is used instead of the SQL for samples in which the SQL is not apparent from the sample data (Ref. 26, p. 2).

Sample ID	Hazardous Substance	Concentration	SDL/ CRDL/SQL	Reference(s)
MATRIX: Surface Water				
RSDS-01-SW	Arsenic	17 µg/L	10 µg/L	7, pp. 4, 5; 9, Appendix A - p. 156; 24, p. 5; 25, p. 2; 68, pp. 1, 2, 11; 69
RSDS-02-SW	Lead	40 µg/L	10 µg/L	7, p. 4; 9, Appendix A - p. 157; 24, p. 5; 25, p. 2; 68, pp. 1, 11; 69
RSDS-06-SW	Arsenic	18 µg/L	10 µg/L	7, p. 4; 9, Appendix A - p. 162; 24, p. 4; 25, p. 2; 68, pp. 2, 11; 69
	Manganese	73 µg/L	15 µg/L	7, p. 4; 9, Appendix A - p. 162; 24, p. 4; 25, p. 2; 68, pp. 2, 11; 69
MATRIX: Sediment				
RSDS-02-SD	Chromium	28 mg/kg	1 mg/kg	7, p. 4; 9, Appendix A - p. 181; 24, p. 5; 25, p. 2; 68, pp. 3, 11; 69
	Copper	93 mg/kg	2.5 mg/kg	7, p. 4; 9, Appendix A - p. 181; 24, p. 5; 25, p. 2; 68, pp. 3, 11; 69
	Manganese	27 mg/kg	1.5 mg/kg	7, p. 4; 9, Appendix A - p. 181; 24, p. 5; 25, p. 2; 68, pp. 3, 11; 69
	Zinc	470 mg/kg	6 mg/kg	7, p. 4; 9, Appendix A - p. 181; 24, p. 5; 25, p. 2; 68, pp. 3, 11; 69
RSDS-03-SD	Arsenic	10.34 J* mg/kg (18 J mg/kg)	1 mg/kg	7, p. 9; 9, Appendix A - p. 182; 24, p. 9; 25, p. 2; 27, p. 2; 68, pp. 4, 15; 69
	Barium	88 mg/kg	20 mg/kg	7, p. 9; 9, Appendix A - p. 182; 24, p. 9; 25, p. 2; 68, pp. 4, 15; 69
	Chromium	47 mg/kg	1 mg/kg	7, p. 9; 9, Appendix A - p. 182; 24, p. 9; 25, p. 2; 68, pp. 4, 15; 69
	Copper	150 mg/kg	2.5 mg/kg	7, p. 9; 9, Appendix A - p. 182; 24, p. 9; 25, p. 2; 68, pp. 4, 15; 69
	Lead	980 mg/kg	1 mg/kg	7, p. 9; 9, Appendix A - p. 182; 24, p. 9; 25, p. 2; 68, pp. 4, 15; 69

1998 ESI Samples (Continued)

Sample ID	Hazardous Substance	Concentration	SDL/ CRDL/SQL	Reference(s)
RSDS-03-SD (Concluded)	Manganese	53 mg/kg	1.5 mg/kg	7, p. 9; 9, Appendix A - p. 182; 24, p. 9; 25, p. 2; 68, pp. 4, 15; 69
	Zinc	1,700 mg/kg	6 mg/kg	7, p. 9; 9, Appendix A - p. 182; 24, p. 9; 25, p. 2; 68, pp. 4, 15; 69
RSDS-06-SD	Mercury	0.16 mg/kg	0.1 mg/kg	7, p. 4; 9, Appendix A - p. 185; 24, p. 4; 25, p. 2; 68, pp. 4, 13; 69

Notes:

The original concentration for adjusted J-qualified (estimated) analytical results is presented in parentheses.

CRDLS - Contract Required Detection Limit
SDL - Sample Detection Limit
SQL - Sample Quantitation Limit
RSDS - Raleigh Street Dump Site
SW - Surface water
µg/L - Micrograms per liter
SD - Sediment
mg/kg - Milligrams per kilogram
µg/kg - Micrograms per kilogram
J* - Estimated concentration adjusted in accordance with Reference 28 (see Reference 27).
U - Indicates the compound/substance was analyzed for, but not detected. The associated numerical value is the SQL or SDL.

1998 ESI Samples (Continued)
- Background Samples - Delaney Creek

Between August 25-27, 1998, as part of the ESI and on behalf of EPA, TT-EMI START personnel collected background surface water and sediment samples from Delaney Creek (Refs. 7; 9, pp. 1, 10, 14-17; 24; 68, pp. 1-22). Surface water sample RSDS-13-SW and sediment sample RSDS-13-SD were collected from Delaney Creek, in the vicinity of the railroad track bridge crossing, downstream of the former Chloride Metals facility and Carrol Tire property (Refs. 7, pp. 6, 7; 9, pp. 10, 14-17). Surface water sample RSDS-12-SW and sediment sample RSDS-12-SD were collected from Delaney Creek, upstream of RSD and adjacent to the D&B Construction property (Refs. 7, p. 6; 9, pp. 10, 14-17). No other facility is between background sampling location RSDS-12-SW and RSDS-12-SD and the RSD property (Refs. 1, pp. 1-3; 9, p. 10). Both sets of background samples were collected upstream of the RSD property (Refs. 7, pp. 6, 7; 9, pp. 10, 14-17). Sample locations are depicted in Figure 3 of this HRS documentation record. Also, refer to the sample location summary tables presented in Reference 9.

All surface water samples were collected from between 0 to 2 inches below the water surface (Ref. 47). Water quality parameters, including temperature, conductivity, pH, and turbidity, were recorded at each surface water sampling location (Ref. 7, pp. 4-9). Ranges of each parameter were as follows: 27.2 °C to 32.7 °C, for temperature; 0.324 µS/cm to 10.9 µS/cm, for conductivity; 6.23 to 6.76 standard pH units, for pH; and 1.61 NTU to 19.3 NTU, for turbidity (Ref. 7, pp. 4-9).

All sediment samples were collected from a depth of 0 to 3 inches (Ref. 7, pp. 1-9). In general, the sediment samples contained light and dark charcoal grey to dark brown sand, silt, and clay, with an odor of decaying organic matter (Ref. 7, pp. 4-9).

Background sediment and surface water samples were collected from similar depths, employed the same sampling methods, consisted of similar physical and chemical attributes, and were collected during the same sampling event. As a result, they are considered sufficiently similar to allow for comparison to document an increase in contaminant levels (Ref. 7, pp. 1-9; 9, Appendix A; 47). The following table summarizes the background samples collected from Delaney Creek by TT-EMI START in August 1998.

Sample ID	Sample Source	Sample Depth (Inches)	Date/ Time (hrs) Collected	Reference(s)
MATRIX: Surface Water				
RSDS-12-SW	Sample collected from Delaney Creek, upstream (east) of RSD and adjacent to the D&B Construction property, in order to establish reference concentrations for surface water sample comparisons. temperature = 29.0 °C conductivity = 1.19 µS/cm pH = 6.56 turbidity = 1.61 NTU	0 to 2	08/26/98 1115	7, p. 6; 9, pp. 10, 15, Appendix B; 24, p. 8; 47; 68, pp. 5, 20
RSDS-13-SW	Sample collected from Delaney Creek, upstream (east) of RSD, in the vicinity of the railroad track bridge crossing, in order to establish reference concentrations for surface water sample comparisons. temperature = 28.5 °C conductivity = 0.324 µS/cm pH = 6.23 turbidity = 1.88 NTU	0 to 2	08/26/98 1220	7, pp. 6, 7; 9, pp. 10, 15, Appendix B; 24, p. 8; 47; 68, pp. 7, 8, 21

1998 ESI Samples (Continued)

Sample ID	Sample Source	Sample Depth (Inches)	Date/ Time (hrs) Collected	Reference(s)
MATRIX: Sediment				
RSDS-12-SD	Sample co-located with RSDS-12-SW, in order to establish reference concentrations for sediment sample comparisons. Material was light brown/tan, very sandy, mixed with organic debris.	0 to 3	08/26/98 1130	7, p. 6; 9, pp. 10, 16, Appendix B; 24, p. 6; 68, pp. 4, 15, 18
RSDS-13-SD	Sample co-located with RSDS-13-SW, in order to establish reference concentrations for sediment sample comparisons. Material was light grey to dark brown, sandy and somewhat clayey. Material had an odor of decaying organic matter.	0 to 3	08/26/98 1225	7, pp. 6, 7; 9, pp. 10, 17, Appendix B; 24, p. 6; 68, pp. 7, 18, 20

Notes:

RSDS - Raleigh Street Dump Site
SW - Surface Water
SD - Sediment
µS/cm - Microsiemens per centimeter
°C - Degrees Celsius
NTU - Nephelometric Turbidity Unit
hrs - Hours

- Background Sample Concentrations - Delaney Creek

Samples were analyzed by an EPA CLP laboratory; analytical data sheets are provided in Reference 9, Appendix A. Data validation was conducted by EPA Region 4 SESD (Refs. 9, Appendix A; 69; 70). The CRDLs are provided in lieu of SDLs for inorganic substances. The CRDLs are listed in Reference 25 (Ref. 25, p. 2). For organic substances, the CRQL is used instead of the SQL for samples in which the SQL is not apparent from the sample data (Ref. 26, p. 2).

Sample ID	Hazardous Substance	Concentration	SDL/ CRDL/SQL	Reference(s)
MATRIX: Surface Water				
RSDS-12-SW	Lead	ND (3 µg/L)	10 µg/L	7, p. 6; 9, Appendix A - p. 168; 24, p. 8; 25, p. 2; 68, pp. 5, 20; 69
RSDS-13-SW	Lead	2 U µg/L	10 µg/L	7, pp. 6, 7; 9, Appendix A - p. 169; 24, p. 8; 25, p. 2; 68, pp. 7, 8, 21; 69
MATRIX: Sediment				
RSDS-12-SD	Chromium	5.5 mg/kg	1 mg/kg	7, p. 6; 9, Appendix A - p. 191; 24, p. 6; 25, p. 2; 68, pp. 4, 15, 18; 69
	Copper	3.90 J* mg/kg (3.2 J mg/kg)	2.5 mg/kg	7, p. 6; 9, Appendix A - p. 191; 24, p. 6; 25, p. 2; 27, p. 2; 68, pp. 4, 15, 18; 69
	Lead	36 mg/kg	1 mg/kg	7, p. 6; 9, Appendix A - p. 191; 24, p. 6; 25, p. 2; 68, pp. 4, 15, 18; 69

1998 ESI Samples (Continued)

Sample ID	Hazardous Substance	Concentration	SDL/ CRDL/SQL	Reference(s)
RSDS-12-SD (concluded)	Zinc	22 mg/kg	6 mg/kg	7, p. 6; 9, Appendix A - p. 191; 24, p. 6; 25, p. 2; 68, pp. 4, 15, 18; 69
	Dimethyl phthalate	420 U µg/kg	420 µg/kg	7, p. 6; 9, Appendix A - p. 281; 24, p. 6; 25, p. 2; 68, pp. 4, 15, 18; 69
RSDS-13-SD	Chromium	3.7 mg/kg	1 mg/kg	7, pp. 6, 7; 9, Appendix A - p. 192; 24, p. 6; 25, p. 2; 68, pp. 7, 18, 20; 69
	Copper	9.03 J* mg/kg (7.4 J mg/kg)	2.5 mg/kg	7, pp. 6, 7; 9, Appendix A - p. 192; 24, p. 6; 25, p. 2; 27, p. 3; 68, pp. 7, 18, 20; 69
	Lead	32 mg/kg	1 mg/kg	7, pp. 6, 7; 9, Appendix A - p. 192; 24, p. 6; 25, p. 2; 68, pp. 7, 18, 20; 69
	Zinc	46 mg/kg	6 mg/kg	7, pp. 6, 7; 9, Appendix A - p. 192; 24, p. 6; 25, p. 2; 68, pp. 7, 18, 20; 69
	Dimethyl phthalate	470 U µg/kg	470 µg/kg	7, pp. 6, 7; 9, Appendix A - p. 283; 24, p. 6; 25, p. 2; 68, pp. 7, 18, 20; 70

Notes:

The original concentration for adjusted J-qualified (estimated) analytical results is presented in parentheses.

CRDLS - Contract Required Detection Limit
SDL - Sample Detection Limit
SQL - Sample Quantitation Limit
RSDS - Raleigh Street Dump Site
SW - Surface Water
U - Indicates the compound/substance was analyzed for, but not detected. The associated numerical value is the SQL.
µg/L - Micrograms per liter
SD - Sediment
mg/kg - Milligrams per kilogram
µg/kg - Micrograms per kilogram
J* - Estimated concentration adjusted in accordance with Reference 28 (See Reference 27).
ND - Substance not detected above CRDL
( ) - Reported concentration in parentheses.

- Contaminated Samples - Delaney Creek

Between August 25-27, 1998, as part of the ESI and on behalf of EPA, TT-EMI START personnel collected surface water and sediment samples from Delaney Creek and the wetland area contiguous to Delaney Creek (needle rush marsh) (Refs. 7; 9, pp. 1, 10, 14-17; 24; 68, pp. 1-22). All surface water samples were collected from between 0 to 2 inches below the water surface (Ref. 47). All sediment samples were collected from a depth of 0 to 3 inches (Ref. 7, pp. 1-9). Sample locations are depicted in Figure 3 of this HRS documentation record. Also, refer to the sample location summary tables presented in Reference 9. The following table summarizes the surface water and sediment samples collected from Delaney Creek by TT-EMI START in August 1998.

1998 ESI Samples (Continued)

Sample ID	Sample Source	Sample Depth (Inches)	Date/ Time (hrs) Collected	Reference(s)
MATRIX: Surface Water				
RSDS-07-SW	Sample collected from the northwestern portion of the needle rush marsh, southwest of RSD, in order to establish potential impact on targets along the downstream pathway. temperature = 27.2 °C conductivity = 4.74 µS/cm pH = 6.41 turbidity = 19.3 NTU	0 to 2	08/25/98 1050	7, p. 3; 9, pp. 10, 14, Appendix B; 24, p. 4; 47; 68, pp. 1, 11
RSDS-08-SW	Sample collected from the northeastern portion of the needle rush marsh, southwest of RSD, in order to establish potential impact on targets along the downstream pathway. temperature = 32.7 °C conductivity = 7.04 µS/cm pH = 6.83 turbidity = 6.56	0 to 2	08/26/98 1500	7, p. 7; 9, pp. 10, 14, Appendix B; 24, p. 8; 47; 68, pp. 6, 20
RSDS-09-SW	Sample collected from the south-central portion of the needle rush marsh, southwest of RSD, in order to establish potential impact on targets along the downstream pathway. temperature = 28.9 °C conductivity = 10.9 µS/cm pH = 6.76 turbidity = 2.41 NTU	0 to 2	08/26/98 0945	7, p. 5; 9, pp. 10, 14, Appendix B; 24, p. 8; 47; 68, pp. 6, 20
RSDS-10-SW*	Sample collected from Delaney Creek, in the vicinity of its confluence with the western drainage canal, in order to establish potential impact on targets along the downstream pathway. temperature = 28.0 °C conductivity = 4.41 µS/cm pH = 6.75 turbidity = 5.4 NTU	0 to 2	8/25/98 1000	7, pp. 2,3; 9, pp. 10, 14, Appendix B; 24, p. 4; 47; 68, pp. 1, 2, 11
RSDS-11-SW	Sample collected from the north side of Delaney Creek, south of RSD, in order to establish potential impact on targets along the downstream pathway. temperature = 31.6 °C conductivity = 4.73 µS/cm pH = 6.69 turbidity = 5.63 NTU	0 to 2	8/26/98 1040	7, p. 6; 9, pp. 10, 14, Appendix B; 24, p. 8; 47; 68, pp. 5, 20

1998 ESI Samples (Continued)

Sample ID	Sample Source	Sample Depth (Inches)	Date/ Time (hrs) Collected	Reference(s)
MATRIX: Sediment				
RSDS-07-SD	Sample co-located with RSDS-07-SW, in order to establish potential impact on targets along the downstream pathway. Material was dark charcoal grey, sandy, some organic matter, and very high moisture content.	0 to 3	08/25/98 1055	7, p. 3; 9, pp. 10, 16, Appendix B; 24, p. 5; 68, pp. 2, 12, 19
RSDS-08-SD	Sample co-located with RSDS-08-SW, in order to establish potential impact on targets along the downstream pathway. Material was dark charcoal grey, silty, with an odor of decaying organic matter.	0 to 3	08/26/98 1505	7, p. 7; 9, pp. 10, 16, Appendix B; 24, p. 6; 68, pp. 7, 16
RSDS-09-SD	Sample co-located with RSDS-09-SW, in order to establish potential impact on targets along the downstream pathway. Material was sandy, gritty. The first 0.25 inches was very dark charcoal grey, beneath which was lighter dark brown containing much organic matter. Strong odor of decaying organic matter.	0 to 3	08/26/98 1010	7, pp. 5, 6; 9, pp. 10, 16, Appendix B; 24, pp. 6, 7; 68, pp. 4, 16, 17
RSDS-10-SD*	Sample co-located with RSDS-10-SW, in order to establish potential impact on targets along the downstream pathway. Material was dark grey to black, sandy silty, with some clay, and containing much organic matter (i.e., shells, leaves, branches). Odor of decaying organic matter.	0 to 3	08/25/98 1010	7, pp. 2, 3; 9, pp. 10, 16, Appendix B; 24, p. 5; 68, pp. 2, 12, 19
RSDS-11-SD	Sample co-located with RSDS-11-SW, in order to establish potential impact on targets along the downstream pathway. Description of sample material not available.	0 to 3	08/26/98 1045	7, p. 6; 9, pp. 10, 16, Appendix B; 24, p. 6; 68, pp. 7, 15, 17

Notes:

*Since samples RSDS-10-SW and RSDS-10-SD were collected from Delaney Creek near its confluence with the western drainage canal, the sample was compared to all three background samples (RSDS-05-SW and RSDS-05-SD; RSDS-12-SW and RSDS-12-SD; and RSDS-13-SW and RSDS-13-SD).

RSDS - Raleigh Street Dump Site
SW - Surface Water
SD - Sediment
µS/cm - Microsiemens per centimeter
°C - Degrees Celsius
NTU - Nephelometric Turbidity Unit
hrs - Hours

- Contaminated Samples Analytical Concentrations - Delaney Creek

Samples were analyzed by an EPA CLP laboratory; analytical data sheets are provided in Reference 9, Appendix A. Data validation was conducted by EPA Region 4 SESD (Refs. 9, Appendix A; 69; 70). The CRDLs are provided in lieu of SDLs for inorganic substances. The CRDLs are listed in Reference 25 (Ref. 25, p. 2). For organic substances, the CRQL is used instead of the SQL for samples in which the SQL is not apparent from the sample analytical data (Ref. 26, p. 2).

Sample ID	Hazardous Substance	Concentration	SDL/ CRDL/SQL	Reference(s)
MATRIX: Surface Water				
RSDS-08-SW	Lead	67 µg/L	10 µg/L	7, p. 7; 9, Appendix A - p. 164; 24, p. 8; 25, p. 2; 68, pp. 6, 20
RSDS-10-SW	Lead	11 µg/L	10 µg/L	7, pp. 2,3; 9, Appendix A - p. 166; 24, p. 4; 25, p. 2; 68, pp. 1, 2, 11
RSDS-11-SW	Lead	24 µg/L	10 µg/L	7, p. 6; 9, Appendix A - p. 167; 24, p. 8; 25, p. 2; 68, pp. 5, 20
MATRIX: Sediment				
RSDS-08-SD	Chromium	19 mg/kg	1 mg/kg	7, p. 7; 9, Appendix A - p. 187; 24, p. 6; 25, p. 2; 68, pp. 7, 16
	Copper	31 mg/kg	2.5 mg/kg	7, p. 7; 9, Appendix A - p. 187; 24, p. 6; 25, p. 2; 68, pp. 7, 16
	Lead	440 mg/kg	1 mg/kg	7, p. 7; 9, Appendix A - p. 187; 24, p. 6; 25, p. 2; 68, pp. 7, 16
	Dimethyl Phthalate	3,000 µg/kg	1,600 µg/kg	7, p. 7; 9, Appendix A - p. 273; 24, p. 6; 68, pp. 7, 16
RSDS-10-SD	Lead	180 mg/kg	1 mg/kg	7, pp. 2-3; 9, Appendix A - p. 189; 25, p. 2; 68, pp. 2, 12, 19
	Zinc	160 mg/kg	6 mg/kg	7, pp. 2-3; 9, Appendix A - p. 189; 25, p. 2; 68, pp. 2, 12, 19

Notes:

The original concentration for adjusted J-qualified (estimated) analytical results is presented in parentheses.

CRDLS - Contract Required Detection Limit
SDL - Sample Detection Limit
SQL - Sample Quantitation Limit
RSDS - Raleigh Street Dump Site
SD - Sediment
SW - Surface water
µg/L - Micrograms per liter
mg/kg - Milligrams per kilogram
µg/kg - Micrograms per kilogram
J* - Estimated concentration adjusted in accordance with Reference 28 (see Reference 27).

Chemical Analysis

2001 Phase 1 RI Samples

- Canals

In March 2001, as part of the Phase 1 RI and on behalf of EPA, CDM collected three sediment samples (SD01, SD02, and SD03) from the western drainage canal, approximately 1,500 ft upstream and northeast of RSD (see Figure 7). In addition, four sediment samples, including one duplicate, were collected from three sediment sampling stations (SD04, SD05, and SD06) located in the birdfoot drainage canals (Ref. 16, pp. 17-20, 97, 408, 409, 966-968, 974). Analytical results revealed that upstream sample SD03 generally contained the highest concentrations of metals(Ref 16, pp. 53, 54, 223, 224, 879-885). As a result, an observed release could not be documented with the Phase 1 RI sediment samples.

2002 Phase 2 RI Samples

- Canals

In August 2002, as part of Phase 2 RI and on behalf of EPA, CDM collected surface water and co-located sediment samples from 18 sampling stations (SDSW01 through SDSW18) located in the vicinity of RSD (see Figure 7) (Ref. 16, pp. 17-22, 98, 509-520, 1482-1486, 1503-1507; 67, pp. 1, 2, 555-607). CDM attempted to collect both a high tide surface water sample and a low tide surface water sample from each sampling station. However, low tide surface water samples could not be collected from several of the downstream sampling stations along Delaney Creek because the sampling locations along Delaney Creek were dry during low tide (water levels had dropped below sampling stations)(Ref. 16, pp. 21, 22, 504-510). Three sampling stations (SDSW04, SDSW05, and SDSW06) were located upstream of RSD in drainage canal tributaries to the western drainage canal, including sampling stations (SDSW04 and SDSW05) located in a drainage canal that historically received runoff and wastewater discharges from the former Chloride Metals facility (Refs. 4, pp. 2, 5, 13; 16, pp. 98, 29). Sampling station SDSW12 was located in the western drainage canal, upstream of RSD. The surface water and sediment samples collected from these upstream stations were used to establish background levels for the surface water and sediment samples collected from the sampling stations in the birdfoot drainage canals (SDSW13, SDSW14, and SDSW18) and in the western drainage canal, downstream of its confluence with the birdfoot drainage canals (SDSW15, SDSW16, and SDSW17). Analytical results of sediment sample SD04 contained significantly high concentrations of metals, particularly lead (1,200 mg/kg) (Ref. 16, pp. 29, 98, 1251-1317). As a result, an observed release could not be documented with the Phase 2 RI sediment samples collected from the birdfoot drainage canals/western drainage canal surface water pathway.

- Background Samples - Delaney Creek

In August 2002, on behalf of EPA, CDM collected three background surface water and co-located sediment samples from Delaney Creek (SDSW01, SDSW02, and SDSW03) as part of Phase 2 RI sampling activities (Ref. 16, pp. 17-21, 98, 509-520). CDM collected both a high tide surface water sample and a low tide surface water sample from each background sampling station. However, low tide surface water samples could not be collected from several of the downstream sampling stations in the needle rush marsh along Delaney Creek because the sampling locations along Delaney Creek were dry during low tide (water levels had dropped below sampling stations)((Ref. 16, pp. 21, 22, 504-510). As a result, only the surface water samples collected during high tide are used in this HRS documentation record.

Sediment/surface water sample pair SDSW03 was collected from Delaney Creek, approximately 0.5 miles upstream (east) of RSD, downstream of the U.S. Highway 41 bridge crossing, upstream of the railroad bridge crossing (Ref. 16, pp. 98, 509, 512, 516). Sediment/surface water sample pair SDSW03 was collected from Delaney Creek, adjacent to the former Chloride Metals facility. Sediment/surface water sample pair SDSW02 was collected from Delaney Creek, approximately 0.3 miles upstream (east) of

2002 Phase 2 RI Samples (Continued)

RSD, in the vicinity of the railroad bridge crossing, upstream of the D&B Construction property (Ref. 16, pp. 98, 510, 513, 516). Sediment/surface water sample pair SDSW01 was collected from Delaney Creek, in the vicinity of the mobile home park and the D&B Construction property (Ref. 16, pp. 98, 510, 512, 516). No other facility is between this background sample location and the RSD property (Refs. 3, pp. 1-3; 16, p. 98, 516). Sample locations are depicted on Figure 7 of this HRS documentation record.

All surface water samples were collected from approximately 0 to 3 inches below the surface of the water body (Ref. 57). Water quality parameters, including pH, conductivity, dissolved oxygen (D.O.), temperature, salinity, and turbidity, were recorded at each surface water sampling location along Delaney Creek (Ref. 16, pp. 22, 504-510). Ranges of each parameter were as follows: 6.83 to 7.00 standard pH units, for pH; 0.267 µS/cm to 2.26 µS/cm, for conductivity; 8.26 mg/L to 8.62 mg/L, for D.O.; 24.4 °C to 25.7 °C, for temperature; 0.01 % to 0.10 %, for salinity; and 41.8 NTU to 381 NTU, for turbidity (Ref. 16, pp. 504-510).

All sediment samples were collected from a depth of 0 to 6 inches (Ref. 57). The sediment samples collected during the Phase 2 RI were analyzed for grain size distribution. The sediments consist primarily (>60 %) of fine to very fine sand-sized particles. Nearly half of the sediment samples analyzed contained about 20 to 40 % silt and clay-sized particles. The remaining sediment samples contained less than 20 % silt and clay-sized particles (Ref. 16, pp. 29, 66, 272-377, 1482-1486).

Background sediment and surface water samples were collected from similar depths, employed the same sampling methods, consisted of similar physical and chemical attributes, and were collected during the same sampling event (Ref. 16, pp. 41, 42, 504-510, 1255-1380; 57). The following table summarizes the background samples collected from Delaney Creek during high tide by CDM in August 2002.

Sample ID	Sample Source	Sample Depth (Inches)	Date/ Time (hrs) Collected	Reference(s)
MATRIX: Surface Water				
SW01 (SW-1-2)	Sample was collected from Delaney Creek during high tide, in the vicinity of the mobile home park and the D&B Construction property, in order to establish reference concentrations for surface water sample comparisons. pH = 6.96 conductivity = 0.267 µS/cm D.O. = 8.46 mg/L temperature = 25.5 °C salinity = 0.01 % turbidity = 321 NTU	0 to 3	08/15/02 0925	16, pp. 98, 510, 516; 57; 67, pp. 1, 2, 588, 590
SW01 (SW-51-2)	Duplicate of surface water sample SW01, collected for quality control.	0 to 3	08/15/02 0935	16, pp. 98, 510, 516; 57; 67, pp. 1, 2, 588, 590

2002 Phase 2 RI Samples (Continued)

Sample ID	Sample Source	Sample Depth (Inches)	Date/ Time (hrs) Collected	Reference(s)
SW02 (SW-2-2)	Sample collected from Delaney Creek, approximately 0.3 miles upstream (east) of RSD during high tide, in the vicinity of the railroad bridge crossing, upstream of the D&B Construction property, in order to establish reference concentrations for surface water sample comparisons. pH = 7.00 conductivity = 0.293 µS/cm D.O. = 8.27 mg/L temperature = 25.7 °C salinity = 0.01 % turbidity = 43.2 NTU	0 to 3	08/15/02 0915	16, pp. 98, 510, 516; 57; 67, pp. 1, 2, 588, 590
SW03 (SW-3-2)	Sample collected from Delaney Creek during high tide, approximately 0.5 miles upstream (east) of RSD, downstream of the U.S. Highway 41 bridge crossing, upstream of the railroad bridge crossing, in order to establish reference concentrations for surface water sample comparisons. pH = 6.97 conductivity = 0.304 µS/cm D.O. = 8.26 mg/L temperature = 25.3 °C salinity = 0.01 % turbidity = 325 NTU	0 to 3	08/15/02 0850	16, pp. 98, 509, 516; 57; 67, pp. 1, 2, 588, 590
Matrix: Sediment				
SD01	Sample co-located with SW01, in order to establish reference concentrations for sediment sample comparisons. Description of sample material = see note below*.	0 to 6	08/28/02 1450	16, pp. 98, 512, 516, 1483, 1485; 57; 67, pp. 1, 2, 603
SD02	Sample co-located with SW03, in order to establish reference concentrations for sediment sample comparisons. Description of sample material = see note below*.	0 to 6	08/29/02 1345	16, pp. 98, 513, 516, 1483, 1485, 57; 67, pp. 1, 2, 605
SD03	Sample co-located with SW03, in order to establish reference concentrations for sediment sample comparisons. Description of sample material = see note below*.	0 to 6	08/28/02 1355	16, pp. 98, 512, 516, 1483, 1485, 57; 67, pp. 1, 2, 603

Notes:
*The sediment samples collected during the Phase 2 RI were analyzed for grain size distribution. The sediments consist primarily (>60 %) of fine to very fine sand-sized particles. Nearly half of the sediment samples analyzed contained about 20 to 40 % silt and clay-sized particles. The remaining sediment samples contained less than 20 % silt and clay-sized particles (Ref. 16, pp. 29, 66, 272-377, 1482-1486).

RSD - Raleigh Street Dump
SD - Sediment
°C - Degrees Celsius
% - Percent
mg/L - Milligrams per liter
SW - Surface Water
µS/cm - Microsiemens per centimeter
NTU - Nephelometric Turbidity Unit
D.O. - Dissolved oxygen
hrs - Hours

2002 Phase 2 RI Samples (Continued)
- Background Samples Analytical Concentrations - Delaney Creek

All sediment and surface water samples collected during the Phase 2 RI were analyzed by an EPA CLP laboratory; analytical data sheets are provided in Reference 16, pp. 1250-1380. All data validation was conducted by EPA Region 4 SESD (Refs. 16, pp. 41, 42; 73-78). The CRDLs are provided in lieu of SDLs for inorganic substances. The CRDLs are listed in Reference 25 (Ref. 25, p. 2). For organic substances, the CRQL is used instead of the SQL for samples in which the SQL is not apparent from the sample data (Ref. 26, p. 2).

Because sufficient non-qualified data are available, Phase 2 RI analytical results that were estimated (J-qualified) are not included in this HRS documentation record (Refs. 73-78).

Sample ID	Hazardous Substance	Concentration	SDL/ CRDL/SQL	Reference(s)
MATRIX: Surface Water				
SW01 (SW-1-2)	Chromium	ND (2.1 µg/L)	10 µg/L	16, pp. 98, 510, 516; 25, p. 2; 57; 58, p. 30; 67, pp. 1, 2, 588, 590; 73; 75
	Zinc	ND (20 µg/L)	60 µg/L	
SW01 (Dup.) (SW-51-2)	Chromium	ND (2.2 µg/L)	10 µg/L	16, pp. 98, 510, 516; 25, p. 2; 57; 58, p. 35; 67, pp. 1, 2, 588, 590; 73; 75
	Zinc	ND (18 µg/L)	60 µg/L	
SW02 (SW-2-2)	Chromium	ND (2.1 µg/L)	10 µg/L	16, pp. 98, 510, 516; 25, p. 2; 57; 58, p. 32; 67, pp. 1, 2, 588, 590; 73; 75
	Zinc	ND (18 µg/L)	60 µg/L	
SW03 (SW-3-2)	Chromium	ND (2.5 µg/L)	10 µg/L	16, pp. 98, 509, 516; 25, p. 2; 57; 58, p. 33; 67, pp. 1, 2, 588, 590; 73; 75
	Zinc	ND (38 µg/L)	60 µg/L	
MATRIX: Sediment				
SD01	Arsenic	0.90 U mg/kg	1 mg/kg	16, pp. 98, 512, 516, 1251, 1483, 1485; 25, p. 2; 57; 67, pp. 1, 2, 603; 73; 75
	Chromium	3.1 mg/kg	1 mg/kg	
	Vanadium	ND (2.2 mg/kg)	5 mg/kg	
SD02	Arsenic	0.88 U mg/kg	1 mg/kg	16, pp. 98, 513, 516, 1252, 1483, 1485; 25, p. 2; 57; 67, pp. 1, 2, 605; 73; 75
	Chromium	3.4 mg/kg	1 mg/kg	
	Nickel	ND (1.0 mg/kg)	4 mg/kg	
	Vanadium	ND (2.7 mg/kg)	5 mg/kg	
SD03	Arsenic	1.1 mg/kg	1 mg/kg	16, pp. 98, 512, 516, 1253, 1483, 1485; 25, p. 2; 57; 67, pp. 1, 2, 603; 73; 75
	Chromium	3.6 mg/kg	1 mg/kg	
	Nickel	ND (1.1 mg/kg)	4 mg/kg	
	Vanadium	5.4 mg/kg	5 mg/kg	

Notes:

CRDLS - Contract Required Detection Limit
SDL - Sample Detection Limit
SQL - Sample Quantitation Limit
SD - Sediment
SW - Surface Water
µg/L - Micrograms per liter
mg/kg - Milligrams per kilogram
Dup. - Duplicate
U - Indicates the compound/substance was analyzed for, but not detected. The associated numerical value is the SQL.
ND - Substance not detected above CRDL

2002 Phase 2 RI Samples (Continued)

( ) - Reported concentration in parentheses.

2002 Phase 2 RI Samples (Continued)
- Contaminated Samples - Delaney Creek

In August 2002, on behalf of EPA, CDM collected surface water and co-located sediment samples from an area of the needle rush marsh located southwest of RSD as part of Phase 2 RI sampling activities (Ref. 16, pp. 17-21, 98, 509-520). CDM attempted to collect both a high tide surface water sample and a low tide surface water sample from each sampling station. However, low tide surface water samples could not be collected from any of the sampling stations in the needle rush marsh because the locations were dry during low tide (water levels had dropped below sampling stations) (Ref. 16, pp. 21, 22, 504-510). As a result, only the surface water samples collected during high tide are used in this HRS documentation record.

All surface water samples were collected from approximately 0 to 3 inches below the surface of the water body (Ref. 57). All sediment samples were collected from a depth of 0 to 6 inches (Ref. 57). Sample locations are depicted on Figure 7 of this HRS documentation record. The following table summarizes the surface water and sediment samples collected from the needle rush marsh during high tide by CDM in August 2002.

Sample ID	Sample Source	Sample Depth (Inches)	Date/ Time (hrs) Collected	Reference(s)
MATRIX: Surface Water				
SW07 (SW-7-2)	Sample was collected from the needle rush marsh during high tide, southwest of RSD, in order to establish potential impact on targets along the downstream pathway. pH = 6.88 conductivity = 1.88 µS/cm D.O. = 8.62 mg/L temperature = 24.4 °C salinity = 0.08 % turbidity = 41.8 NTU	0 to 3	08/15/02 0730	16, pp. 98, 509, 516; 57; 67, pp. 1, 2, 588, 590
SW08 (SW-8-2)	Sample was collected from the needle rush marsh during high tide, southwest of RSD, in order to establish potential impact on targets along the downstream pathway. pH = 6.94 conductivity = 0.99 µS/cm D.O. = 8.50 mg/L temperature = 24.6 °C salinity = 0.04 % turbidity = 352 NTU	0 to 3	08/15/02 0745	16, pp. 98, 509, 516; 57; 67, pp. 1, 2, 588, 590
SW09 (SW-9-2)	Sample was collected from the needle rush marsh during high tide, southwest of RSD, in order to establish potential impact on targets along the downstream pathway. pH = 6.88 conductivity = 2.26 µS/cm D.O. = 8.61 mg/L temperature = 24.4 °C salinity = 0.10 % turbidity = 381 NTU	0 to 3	08/15/02 0740	16, pp. 98, 509, 516; 57; 67, pp. 1, 2, 588, 590

2002 Phase 2 RI Samples (Continued)

Sample ID	Sample Source	Sample Depth (Inches)	Date/ Time (hrs) Collected	Reference(s)
SW10 (SW-10-2)	Sample was collected from the needle rush marsh during high tide, southwest of RSD, in order to establish potential impact on targets along the downstream pathway. pH = 6.83 conductivity = 0.866 µS/cm D.O. = 8.5 mg/L temperature = 24.7 °C salinity = 0.03 % turbidity = 188 NTU	0 to 3	08/15/02 0720	16, pp. 98, 508, 516; 57; 67, pp. 1, 2, 587, 589
SW11 (SW-11-2)	Sample was collected from the needle rush marsh during high tide, southwest of RSD, in order to establish potential impact on targets along the downstream pathway. pH = 6.9 conductivity = 0.625 µS/cm D.O. = 8.52 mg/L temperature = 24.8 °C salinity = 0.002 % turbidity = 352 NTU	0 to 3	08/15/02 0720	16, pp. 98, 508, 509, 516; 57; 67, pp. 1, 2, 587, 589
MATRIX: Sediment				
SD07	Sample co-located with SW07, in order to establish potential impact on targets along the downstream pathway. Description of sample material = see note below*.	0 to 6	08/16/02 1035	16, pp. 98, 511, 516, 1482; 57; 67, pp. 1, 2, 590, 599-601, 607
SD07 (SD-57)	Duplicate of sediment sample SD07, collected for quality control.	0 to 6	08/16/02 1040	16, pp. 98, 511, 516, 1482; 57; 67, pp. 1, 2, 590, 599-601, 607
SD08	Sample co-located with SW08, in order to establish potential impact on targets along the downstream pathway. Description of sample material = see note below*.	0 to 6	08/16/02 1005	16, pp. 98, 511, 516, 1482; 57; 67, pp. 1, 2, 590, 599-601, 607
SD09	Sample co-located with SW09, in order to establish potential impact on targets along the downstream pathway. Description of sample material = see note below*.	0 to 6	08/16/02 1020	16, pp. 98, 511, 516, 1482; 57; 67, pp. 1, 2, 590, 599-601, 607
SD10	Sample co-located with SW10, in order to establish potential impact on targets along the downstream pathway. Description of sample material = see note below*.	0 to 6	08/16/02 1055	16, pp. 98, 511, 516, 1482; 57; 67, pp. 1, 2, 590, 599-601, 607

2002 Phase 2 RI Samples (Continued)

Sample ID	Sample Source	Sample Depth (Inches)	Date/ Time (hrs) Collected	Reference(s)
SD11	Sample co-located with SW11, in order to establish potential impact on targets along the downstream pathway. Description of sample material = see note below*.	0 to 6	08/16/02 0955	16, pp. 98, 510, 516, 1482; 57; 67, pp. 1, 2, 590, 599-601, 607

Notes:

*The sediment samples collected during the Phase 2 RI were analyzed for grain size distribution. The sediments consist primarily (>60 %) of fine to very fine sand-sized particles. Nearly half of the sediment samples analyzed contained about 20 to 40 % silt and clay-sized particles. The remaining sediment samples contained less than 20 % silt and clay-sized particles (Ref. 16, pp. 29, 66, 272-377, 1482-1486).

RSD - Raleigh Street Dump
SW - Surface Water
SD - Sediment
µS/cm - Microsiemens per centimeter
°C - Degrees Celsius
NTU - Nephelometric Turbidity Unit
% - Percent
D.O. - Dissolved oxygen
mg/L - Milligrams per liter
hrs - Hours
Dup. - Duplicate

- Contaminated Samples Analytical Concentrations - Delaney Creek

All sediment and surface water samples collected during the Phase 2 RI were analyzed by an EPA CLP laboratory; analytical data sheets are provided in Reference 16, pp. 1250-1380. All data validation was conducted by EPA Region 4 SESD (Refs. 16, pp. 41, 42; 73-78). The SDLs (for inorganic substances) are not available. Therefore, the CRDLs are provided in lieu of SDLs for inorganic hazardous substances. The CRDLs are listed in Reference 25. The CRQL is used instead of the SQL (for organic substances) for samples in which the SQL is not apparent from the sample data (Ref. 26, p. 2)

Because sufficient non-qualified data are available, Phase 2 RI analytical results that were estimated (J-qualified) are not included in this HRS documentation record (Refs. 73 - 78).

Sample ID	Hazardous Substance	Concentration	SDL/ CRDL/SQL	References
MATRIX: Surface Water				
SW07 (SW-7-2)	Chromium	10 µg/L	10 µg/L	16, pp. 98, 509, 516; 25, p. 2; 57; 58, p. 36; 67, pp. 1, 2, 588, 590; 73; 75
SW10 (SW-10-2)	Zinc	130 µg/L	60 µg/L	16, pp. 98, 508, 516; 25, p. 2; 57; 58, p. 28; 67, pp. 1, 2, 587, 589; 73; 75

2002 Phase 2 RI Samples (Continued)

Sample ID	Hazardous Substance	Concentration	SDL/ CRDL/SQL	References
MATRIX: Sediment				
SD07	Chromium	11 mg/kg	1 mg/kg	16, pp. 98, 511, 516, 1257, 1482; 25, p. 2; 57; 58, p. 56; 67, pp. 1, 2, 590, 599-601, 607; 73; 75
SD07 (Dup. of SD07)	Arsenic	3.3 mg/kg	1 mg/kg	16, pp. 98, 511, 516, 1258, 1482; 25, p. 2; 57; 58, p. 55; 67, pp. 1, 2, 590, 599-601, 607; 73; 75
	Chromium	13 mg/kg	1 mg/kg	
SD08	Arsenic	5.5 mg/kg	1 mg/kg	16, pp. 98, 511, 516, 1259, 1482; 25, p. 2; 57; 58, p. 57; 67, pp. 1, 2, 590, 599-601, 607; 73; 75
	Chromium	14 mg/kg	1 mg/kg	
	Nickel	5.3 mg/kg	4 mg/kg	
	Vanadium	19 mg/kg	5 mg/kg	
SD09	Chromium	13 mg/kg	1 mg/kg	16, pp. 98, 511, 516, 1260, 1482; 25, p. 2; 57; 58, p. 58; 67, pp. 1, 2, 590, 599-601, 607; 73; 75
SD11	Arsenic	4.4 mg/kg	1 mg/kg	16, pp. 98, 511, 516, 1262, 1482; 25, p. 2; 57; 58, p. 53; 67, pp. 1, 2, 590, 599-601, 607; 73; 75
	Chromium	20 mg/kg	1 mg/kg	
	Nickel	5.6 mg/kg	4 mg/kg	
	Vanadium	17 mg/kg	5 mg/kg	

Notes:

CRDLS - Contract Required Detection Limit
SDL - Sample Detection Limit
SQL - Sample Quantitation Limit
SD - Sediment
SW - Surface Water
µg/L - Micrograms per liter
mg/kg - Milligrams per kilogram
Dup. - Duplicate

Attribution:

The hazardous substances documented in an observed release to the surface water pathway (arsenic, chromium, copper, lead, manganese, mercury, nickel, vanadium, zinc, and dimethyl phthalate) are constituents detected in samples collected from the Chloride Metals facility, are known to be commonly associated with battery reclamation facility wastes, and/or were detected at elevated concentrations in soil samples collected from source areas at RSD (Refs. 4, p. 4; 9, Appendix A; 17, p. 56; 16, Appendix H).

Based on analytical results of soil samples, source areas at RSD contain primarily metals and PAHs. All contaminants detected at elevated concentrations in surface water and sediment samples were also present at elevated concentrations in source area soil samples (see Figures 3, 4, and 5 of this documentation record for sample locations).

The dumped material in the northern portion of RSD is located primarily at the surface, as evidenced by the presence of battery casings, construction debris, tires, etc. in debris piles (Ref. 7, pp. 13, 15-16, 18-19). In March 2001, as part of the RI and on behalf of EPA, CDM excavated 13 test pits on RSD, primarily north of Raleigh Street and its extension (Ref. 16, pp. 51, 91). Fill materials were encountered in 10 of the 13 test pits (Ref. 16, pp. 51, 113-120). The thickness of the landfilled material ranges in depth from 1 to 7 feet, and the ground surface at every test pit location was littered with broken battery casings, construction debris, and/or trash (Ref. 16, pp. 51, 113-120). The northern portion of RSD is currently overgrown with dense vegetation. Visible evidence of battery casing chips has been observed throughout the southern portion of RSD, in the vicinity of the Tampa Fiberglass building, indicating that dumping may have also occurred in this area (Refs. 10, pp. 1, 4, 21; 15, p. 7). However, the southern portion of RSD does not exhibit the same widespread littering of waste materials at the surface like the northen portion. In addition, test pits documenting the presence of landfilled material were primarily excavated in the northern portion of RSD, north of Raleigh Street. Moreover, a review of historical aerial photographs indicates dumping occurred primarily in the northern portion of RSD (Ref. 8, pp. 20-29). In a 1977 aerial photograph, a dump truck was observed adjacent to the northern portion of RSD (Ref. 8, pp. 20-21).

The owner of the RSD property at the time of dumping reportedly used a bulldozer to spread the material over low-lying (wetland) areas and to keep the material away from the road (Ref. 4, p. 3). Based on historical aerial photographs, the dump was active prior to the extension of Raleigh Street, indicating that waste materials may exist under the Raleigh Street extension (Ref. 8, pp. 23, 31). The Raleigh Street extension is an unpaved, limestone gravel-lined service road providing access to the western power line easement (Ref. 10, pp. 1, 21). However, no samples have been collected from beneath Raleigh Street proper or its extension to confirm the presence of hazardous substances. In addition, no test pits have been excavated on Raleigh Street proper or its extension to confirm the presence of landfilled waste.

Stained soil, improperly disposed wastes, and drums not properly stored by Tampa Fiberglass have been observed on the southern portion of the property (Refs. 8, pp. 20-21; 9, p. 7; 17, pp. 89-90). These poor house keeping practices by Tampa Fiberglass may have also contributed to some of the contaminated soil on the southern portion of the property (Refs. 9, p. 7; 17, pp. 5, 18-23, 30-31, 87-99). However, the type of manufacturing by Tampa Fiberglass, including the chemicals used, are not consistent with the hazardous substances associated with the source areas resulting from historical dumping at RSD. Tampa Fiberglass manufactures septic tanks, aircraft simulator shells, and internal tanks for wastewater treatment systems (Refs. 14, p. 1; 15, p. 2). Chemicals used at Tampa Fiberglass are primarily VOCs, such as MEK, methylene chloride, and acetone (Ref. 17, p. 56). Conversely, hazardous substances associated with the dumped materials include heavy metals and PAHs (Refs. 4; 5; 6; 9; 16; 55; 56).

Runoff from the northern portion of the property is directed toward the birdfoot drainage canals that flow into the western drainage canal west of the property; prior to dumping, some of the birdfoot drainage canals extended further east and southeast into the property (Refs. 3, pp. 1, 2; 7, p. 18; 8, pp. 18-23). Runoff from the eastern side of the southern portion of the property is directed to a drainage swale that parallels the power line easement. Runoff from the western side of the southern portion flows across the property into the needle rush marsh. Both drainage pathways enter Delaney Creek just south of the property (Refs. 3, pp. 1, 2; 10, pp. 1, 21; 15, p. 21).

Other facilities in the area include the former Chloride Metals (also known as GNB, Inc.), Carrol Tire Company, LTC Auto, and D&B Construction. These facilities are upgradient and upstream from RSD. LTC Auto provided maintenance for heavy equipment (Refs. 3, p. 2; 4, p. 1; 5, p. 17; 10, p. 1). No information is available about operations at Carrol Tire Company or D&B Construction.

Delaney Creek, the western drainage canal, and the birdfoot drainage canals are tidally influenced surface water bodies (Refs. 6, p. 7; 15, p. 21; 16, pp. 11, 144, 145). The upstream extent of tidal influence on the western drainage canal is not available. Delaney Creek is usually brackish downstream of U.S. Highway 41, which is located approximately 0.65 miles upstream of RSD and upstream of RSD background samples (Refs. 3, pp. 1, 2; 15, p. 21; 49, p. 12). Previous upstream sediment and surface water samples collected from the western drainage canal and Delaney Creek do not indicate contaminants are migrating upstream via tidal flow (Refs. 7; 9; 16; 24). In addition, no facilities or known releases are located along Delaney Creek downstream of RSD that could contribute to the contaminants considered to be at least partially attributable to the RSD sources (Ref. 3, pp. 1, 2).

Arsenic, chromium, copper, lead, mercury, nickel, and zinc are commonly associated with waste materials generated at battery reclamation facilities, particularly recovery of lead from lead-acid storage batteries (Ref. 4, p. 4; 55, pp. 1, 2; 56). In addition, these constituents were detected in the wastewater effluent from Chloride Metals during the 1980 EPA investigation (Ref. 4, p. 4). Chloride Metals contributed battery casings to RSD (Ref. 4, p. 3). Arsenic, chromium, copper, lead, manganese, mercury, nickel, vanadium, zinc, and dimethyl phthalate were detected at elevated concentrations in soil samples collected from on-site source areas (Refs. 9, Appendix A; 16, Appendix H; 4, p. 4). Further, an observed release by direct observation has been documented for cadmium, copper, lead, manganese, nickel, and zinc to the on-site wetland and birdfoot drainage canal (See Section 4.1.2.1.1 of this HRS documentation record). As a result, the presence of these constituents in surface water pathway samples is considered at least partially attributable to source areas located on RSD.

Hazardous Substances Released:

Arsenic
Chromium
Copper
Lead
Manganese
Mercury
Nickel
Vanadium
Zinc

Dimethyl phthalate

Observed Release Factor Value: 550

4.1.2.1.2 POTENTIAL TO RELEASE

4.1.2.1.2.1 Potential to Release by Overland Flow

Potential to release was not evaluated because an observed release to surface water was established by both direct observation and chemical analysis (see Section 4.1.2.1.1 of this HRS documentation record).

4.1.2.2 WASTE CHARACTERISTICS

4.1.2.2.1 Toxicity × Persistence

Hazardous Substance	Source No.	Tox. Factor Value	Pers. Factor Value* (HRS Table 4-11)	Tox. × Pers. Factor Value (HRS Table 4-12)	References
Inorganics					
Antimony	2	10,000	1	10,000	2, p. BI-1
Arsenic	1, 2	10,000	1	10,000	2, p. BI-1
Barium	1, 2	10,000	1	10,000	2, p. BI-1
Beryllium	2	10,000	1	10,000	2, p. BI-2
Cadmium	1, 2	10,000	1	10,000	2, p. BI-2
Chromium	1, 2	10,000	1	10,000	2, p. BI-3
Copper	1, 2	0	1	0	2, p. BI-3
Cyanide	1	100	1	100	2, p. BI-4
Lead	1, 2	10,000	1	10,000	2, p. BI-8
Manganese	1, 2	10,000	1	10,000	2, p. BI-8
Mercury	1	10,000	1	10,000	2, p. BI-8
Nickel	1, 2	10,000	1	10,000	2, P. BI-9
Vanadium	1, 2	100	1	100	2, p. BI-11
Zinc	1, 2	10	1	10	2, p. BI-12
Organics					
Acenaphthane	1	10	0.4	4	2, p. BI-1
Acenaphthylene	1	0	0.4	0	2, p. BI-1
Acetophenone	2	NL	NL	NA	2, p. BI-1
Anthracene	1	10	0.4	4	2, p. BI-1
Benzeldehyde	1, 2	NL	NL	NA	2, p. BI-2
Benzo(a)anthracene	1, 2	1,000	1	1,000	2, p. BI-2
Benzo(a)pyrene	1, 2	10,000	1	10,000	2, p. BI-2
Benzo(b)fluoranthene	1, 2	NL	NL	NA	2, p. BI-2
Benzo(ghi)perylene	1	0	1	0	2, p. BI-2
Benzo(k)fluoranthene	1, 2	100	1	100	2, p. BI-2
Bis(2-ethylhexyl)-phthalate	1, 2	100	1	100	2, p. BI-2
Butylbenzylphthalate	1, 2	10	1	10	2, p. BI-2
Carbazole	1	10	0.4	4	2, p. BI-2
Chrysene	1, 2	10	1	10	2, p. BI-3

Hazardous Substance	Source No.	Tox. Factor Value	Pers. Factor Value* (HRS Table 4-11)	Tox. × Pers. Factor Value (HRS Table 4-12)	References
Organics (Concluded)					
Di-n-butyl phthalate	2	10	1	10	2, p. BI-4
Dibenzo(a,h) anthracene	1	10,000	1	10,000	2, p. BI-4
Dimethyl phthalate	2	NL	NL	NA	2, p. BI-5
Fluoranthene	1, 2	100	1	100	2, p. BI-2
Fluorene	1	100	1	100	2, p. BI-6
Hexachloroethane	2	NL	NL	NA	2, p. BI-8
Indeno(1,2,3-cd)pyrene	1, 2	1,000	1	1,000	2, p. BI-8
Naphthalene	2	1,000	0.4	400	2, p. BI-9
Pentachlorophenol	1	100	1	100	2, p. BI-9
Phenanthrene	1, 2	0	0.4	0	2, p. BI-9
Phenol	2	10	0.0007	0.007	2, p. BI-9
Pyrene	1, 2	100	1	100	2, p. BI-10

Notes:

*Persistence factor value based on a release to a river.

NL - Not listed. The value for this substance is not provided in the Superfund Chemical Data Matrix (SCDM) (Ref. 2).
NA - Not applicable

Toxicity × Persistence Factor Value: 10,000

4.1.2.2.2 Hazardous Waste Quantity

Source Number	Source Hazardous Waste Quantity Value (Section 2.4.2.1.5)	Are source hazardous constituent quantity data complete? (yes/no)
1	38.435	No
2	>0	No

Sum of values: 38.435
HWQ Factor Value: 100

If an Actual Contamination Target (drinking water, human food chain, or environmental threat) exists for the watershed, the calculated hazardous waste quantity score or a score of 100, whichever is greater, is assigned. If no Actual Contamination Targets exist, the hazardous waste quantity score calculated for sources available to migrate to surface water is assigned (Ref. 1, Section 2.4.2.2, Table 2-6).

Level II concentrations have been documented in the HRS eligible wetlands (see Section 4.1.4.3.1.2 of this HRS documentation record); therefore, a hazardous waste quantity of 100 is assigned.

4.1.2.2.3 Waste Characteristics Factor Category Value

Toxicity × Persistence factor value (10,000) ×
HWQ factor value (100): 1E+06

(Ref. 1, Section 2.4.3.1, Table 2-7)

Hazardous Waste Quantity Factor Value: 100
Waste Characteristics Factor Category Value: 32

4.1.2.3 DRINKING WATER TARGETS

No potable water intakes have been identified within the 15-mile downstream target distance limit (Refs. 37-42).

Nearest Intake Factor Value: 0

4.1.2.3.3 Resources

No resources have been documented along the 15-mile target distance limit.

Resources Factor Value: 0

4.1.3.2 WASTE CHARACTERISTICS

4.1.3.2.1 Toxicity × Persistence × Bioaccumulation

Hazardous Substance	Source No.	Tox. Factor Value	Pers. Factor Value* (HRS Table 4-11)	Bioacc. Pot. Factor Value** (HRS Table 4-15)	Tox. Pers. × Bioacc. Pot. Factor Value (HRS Table 4-16)	References
Inorganics						
Antimony	2	10,000	1	5	50,000	2, p. BI-1
Arsenic	1, 2	10,000	1	500	5E+06	2, p. BI-1
Barium	1, 2	10,000	1	500	5E+06	2, p. BI-1
Beryllium	2	10,000	1	50	5E+06	2, p. BI-2
Cadmium	1, 2	10,000	1	50,000	5E+08	2, p. BI-2
Chromium	1, 2	10,000	1	500	5E+06	2, p. BI-3
Copper	1, 2	0	1	50,000	0	2, p. BI-3
Cyanide	1	100	1	0.5	50	2, p. BI-4
Lead	1, 2	10,000	1	5,000	5E+07	2, p. BI-8
Manganese	1, 2	10,000	1	50,000	5E+08	2, p. BI-8
Mercury	1	10,000	1	50,000	5E+08	2, p. BI-8
Nickel	1, 2	10,000	1	500	5E+06	2, P. BI-9
Vanadium	1, 2	100	1	500	50,000	2, p. BI-11
Zinc	1, 2	10	1	50,000	5E+05	2, p. BI-12
Organics						
Acenaphthane	1	10	0.4	500	2,000	2, p. BI-1
Acenaphthylene	1	0	0.4	500	0	2, p. BI-1
Acetophenone	2	NL	NL	NL	NA	2, p. BI-1
Anthracene	1	10	0.4	50,000	2E+05	2, p. BI-1
Benzeldehyde	1, 2	NL	NL	NL	NA	2, p. BI-2
Benzo(a)anthracene	1, 2	1,000	1	50,000	5E+07	2, p. BI-2
Benzo(a)pyrene	1, 2	10,000	1	50,000	5E+08	2, p. BI-2
Benzo(b)fluoranthene	1, 2	NL	NL	NL	NA	2, p. BI-2
Benzo(ghi)perylene	1	0	1	50,000	0	2, p. BI-2
Benzo(k)fluoranthene	1, 2	100	1	50,000	5E+06	2, p. BI-2
Bis(2-ethylhexyl)-phthalate	1, 2	100	1	500	50,000	2, p. BI-2
Butylbenzylphthalate	1, 2	10	1	500	5,000	2, p. BI-2
Carbazole	1	10	0.4	500	2,000	2, p. BI-2
Chrysene	1, 2	10	1	5	50	2, p. BI-3

Hazardous Substance	Source No.	Tox. Factor Value	Pers. Factor Value* (HRS Table 4-11)	Bioacc. Pot. Factor Value** (HRS Table 4-15)	Tox. Pers. × Bioacc. Pot. Factor Value (HRS Table 4-16)	References
Organics (Concluded)						
Di-n-butyl phthalate	2	10	1	5,000	50,000	2, p. BI-4
Dibenzo(a,h) anthracene	1	10,000	1	50,000	5E+08	2, p. BI-4
Dimethyl phthalate	2	NL	NL	NL	NA	2, p. BI-5
Fluoranthene	1, 2	100	1	5,000	5E+06	2, p. BI-2
Fluorene	1	100	1	500	50,000	2, p. BI-6
Hexachloroethane	2	NL	NL	NL	NA	2, p. BI-8
Indeno(1,2,3-cd)pyrene	1, 2	1,000	1	50,000	5E+07	2, p. BI-8
Naphthalene	2	1,000	0.4	5,000	2E+06	2, p. BI-9
Pentachlorophenol	1	100	1	5,000	5E+05	2, p. BI-9
Phenanthrene	1, 2	0	0.4	5,000	0	2, p. BI-9
Phenol	2	10	0.0007	5	0.035	2, p. BI-9
Pyrene	1, 2	100	1	5,000	5E+05	2, p. BI-10

Notes:

*Persistence factor value for rivers.
**Bioaccumulation factor value for salt water.

NL - Not listed. The value for this substance is not provided in the Superfund Chemical Data Matrix (SCDM) (Ref. 2).
NA - Not applicable

Toxicity × Persistence × Bioaccumulation Factor Value: 5E+08

4.1.3.2.2 Hazardous Waste Quantity

Source Number	Source Hazardous Waste Quantity Value (Section 2.4.2.1.5)	Are source hazardous constituent quantity data complete? (yes/no)
1	38.435	No
2	>0	No

Sum of values: 38.435
HWQ Factor Value: 100

If an Actual Contamination Target (drinking water, human food chain, or environmental threat) exists for the watershed, the calculated hazardous waste quantity score or a score of 100, whichever is greater, is assigned. Actual Contamination Targets at Level II concentrations were documented (see Section 4.1.4.3.1.2 of this HRS documentation record). Therefore, a pathway hazardous waste quantity of 100 is assigned (Ref. 1, Section 2.4.2.2, Table 2-6).

4.1.3.2.3 Waste Characteristics Factor Category Value

HWQ factor value: 100

Toxicity factor value × Persistence factor value: 10,000

Bioaccumulation factor value: 50,000

Toxicity × persistence factor value (10,000) × HWQ factor value (100) × bioaccumulation potential factor value (50,000): 5E+10

(Ref. 1, Section 2.4.3.1)

Hazardous Waste Quantity Assigned Value: 100
Waste Characteristics Factor Category Value: 320

4.1.3.3 HUMAN FOOD CHAIN THREAT - TARGETS

Potential Human Food Chain Contamination

1998 ESI Samples

During the 1998 ESI, surface water and sediment sample pair RSDS-08-SW/RSDS-08-SD was collected from the needle rush marsh located southwest of RSD and contiguous with Delaney Creek. In addition, surface water and sediment sample pairs RSDS-10-SW/RSDS-10-SD and RSDS-11-SW/RSDS-11-SD were collected directly from Delaney Creek. Analysis of these samples documented an observed release of arsenic, chromium, copper, lead, zinc, and dimethyl phthalate (Refs. 7, pp. 3, 5, 6; 9, pp. 10, 14-17, Appendix A).

Sample ID	Distance from Probable Point of Entry (PPE)	Hazardous Substance	Bioacc. Pot. Factor Value*
RSDS-08-SW	600 feet (PPE No. 2) 75 feet (PPE No. 3)	Lead	5,000
RSDS-08-SD	600 feet (PPE No. 2) 75 feet (PPE No. 3)	Chromium	500
		Copper	50,000
		Lead	5,000
		Dimethyl phthalate	NL
RSDS-10-SW	950 feet (PPE No. 2) 475 feet (PPE No. 3)	Lead	5,000
RSDS-10-SD	950 feet (PPE No. 2) 475 feet (PPE No. 3)	Lead	5,000
		Zinc	50,000
RSDS-11-SW	450 feet (PPE No. 2) 225 feet (PPE No. 3)	Lead	5,000

Notes:

*Bioaccumulation factor value for salt water (Ref. 2).

NL - Not listed. The value for this substance is not provided in the Superfund Chemical Data Matrix (SCDM) (Ref. 2).

Potential Human Food Chain Contamination

2002 Phase 2 RI Samples

During the 2002 Phase 2 RI, surface water and sediment sample pairs were collected from the needle rush marsh located southwest of RSD and contiguous with Delaney Creek. Analysis of these samples documented an observed release of arsenic, chromium, nickel, vanadium, and zinc.

Sample ID	Distance from Probable Point of Entry (PPE)	Hazardous Substance	Bioacc. Pot. Factor Value*
SW07	600 feet (PPE No. 2) 50 feet (PPE No. 3)	Chromium	500
SD07		Chromium	500
SD07 (Dup. of SD07)		Arsenic	500
		Chromium	500
SD08	600 feet (PPE No. 2) 100 feet (PPE No. 3)	Arsenic	500
		Chromium	500
		Nickel	500
		Vanadium	500
SD09	600 feet (PPE No. 2) 75 feet (PPE No. 3)	Chromium	500
SW10	550 feet (PPE No. 2) 50 feet (PPE No. 3)	Zinc	50,000
SD11	475 feet (PPE No. 2) 100 feet (PPE No. 3)	Arsenic	500
		Chromium	500
		Nickel	500
		Vanadium	500

Notes:

*Bioaccumulation factor value for salt water (Ref. 2).

Dup. - Duplicate

According to the Florida Game and Fresh Water Fish Commission, recreational fishing occurs in Delaney Creek, primarily in the brackish portion of the creek (Refs. 19; 48). In addition, squatters living near/adjacent to RSD reportedly fish Delaney Creek for human food chain organisms (Ref. 65). However, these reports are not specific as to whether the fishing occurs within the particular zones documenting actual contamination. As a result, the area of Delaney Creek affected by actual contamination is not a documented recreational fishery in which human food chain organisms are consumed. Recreational and commercial fishing occurs throughout the entire Tampa Bay, which includes East Bay and Hillsborough Bay (Refs. 50; 66).

Closed Fisheries

No known closed fisheries are located within the 15-mile downstream surface water migration pathway target distance limit; however, a fish consumption advisory is in effect for the entire 15-mile surface water migration pathway (Ref. 51, pp. 19-20). The advisory states that women of child-bearing age and children should limit consumption of fish to one meal per month and other adults to one meal per week (Ref. 51, p. 1). Specific fish pertaining to this advisory, include, but are not limited to, gafftop sail catfish, crevalle jack, ladyfish, spanish mackeral, and shark (Ref. 51, pp. 19-20).

4.1.3.3.1 Food Chain Individual

1998 ESI Samples

Delaney Creek and needle rush marsh:

Sample ID: RSDS-08-SW
Hazardous Substance(s): lead
Bioaccumulation Potential: 5,000

Sample ID: RSDS-08-SD
Hazardous Substance(s): chromium, copper, lead
Bioaccumulation Potential: 500; 50,000; 5,000

Sample ID: RSDS-10-SW
Hazardous Substance(s): lead
Bioaccumulation Potential: 5,000

Sample ID: RSDS-10-SD
Hazardous Substance(s): lead, zinc
Bioaccumulation Potential: 5,000; 50,000

Sample ID: RSDS-11-SW
Hazardous Substance(s): lead
Bioaccumulation Potential: 5,000

2002 Phase 2 RI Samples

Delaney Creek and needle rush marsh:

Sample ID: SW07, SD07
Hazardous Substance(s): arsenic, chromium, nickel
Bioaccumulation Potential: 500; 500; 5,000; 500

Sample ID: SD08
Hazardous Substance(s): arsenic, chromium, nickel, vanadium
Bioaccumulation Potential: 500; 500; 5,000; 500; 500

Sample ID: SD09
Hazardous Substance(s): chromium
Bioaccumulation Potential: 500

Sample ID: SW10
Hazardous Substance(s): zinc
Bioaccumulation Potential: 50,000

Sample ID: SD11
Hazardous Substance(s): arsenic, chromium, nickel, vanadium
Bioaccumulation Potential: 500; 500; 500; 500

Identity of Fishery	Type of Surface Water Body	Dilution Weight	Reference(s)
East Bay	Coastal tidal waters	0.0001	1, Table 4-13; 3, pp. 1, 2
Hillsborough Bay	Coastal tidal waters	0.0001	1, Table 4-13; 3, pp. 1, 2
Tampa Bay	Coastal tidal waters	0.0001	1, Table 4-13; 3, pp. 1, 2

According to the Florida Game and Fresh Water Fish Commission, recreational fishing occurs in Delaney Creek, primarily in the brackish portion of the creek (Refs. 19; 48). In addition, squatters living near/adjacent to RSD fish Delaney Creek for human food chain organisms (Ref. 65). However, these reports are not specific as to whether the fishing occurs within the particular zones documenting actual contamination. As a result, the area of Delaney Creek affected by actual contamination is not a documented recreational fishery in which human food chain organisms are consumed. Recreational and commercial fishing occurs throughout the entire Tampa Bay, which includes East Bay and Hillsborough Bay (Refs. 50; 66).

An observed release to Delaney Creek by chemical analysis was documented. The release contained several hazardous substances with bioaccumulation potential factor values greater than or equal to 500. In addition, the release occurred to a watershed containing fisheries within the target distance limit, but no Level I or Level II fisheries because there is no fishery documented between the PPE and the most downstream observed release sample point. Consequently, a food chain individual value of 20 was assigned.

(Ref. 1, Section 4.1.3.3.1)

Food Chain Individual Factor Value: 20

4.1.3.3.2 Population

4.1.3.3.2.1 Level I Concentrations

No Level I concentrations have been documented within the 15-mile downstream surface water migration pathway target distance limit.

Level I Concentrations Factor Value: 0

4.1.3.3.2.2 Level II Concentrations

No Level II concentrations have been documented within the 15-mile downstream surface water migration pathway target distance limit.

Level II Concentrations Factor Value: 0

4.1.3.3.2.3 Potential Human Food Chain Contamination

Identity of Fishery	Annual Production in Pounds	Type of Surface Water Body	Average Annual Flow Rate	Population Value (P_i)	Dilution Weight (D_i)	Population Value × Dilution Weight ($P_i \times D_i$)	References
East Bay Hllsbrgh. Bay Tampa Bay	>0	Coastal tidal waters	NA	0.03	0.0001	0.000003	1, Tables 4-13, 4-18; 3, pp. 1-3; 51
Sum of Human Food Chain Population Values × Dilution Weights ($P_i \times D_i$) = 0.000003							
Population Values × Dilution Weights ($P_i \times D_i$) ÷ 10 = 0.0000003							

Notes:

NA - Not Applicable (for coastal tidal waters)

East Bay, Hillsborough Bay, and Tampa Bay are all coastal tidal waters. Specific production information was not available for East Bay and Hillsborough Bay, because production data is maintained on a bay-wide basis and a county-wide basis (Refs. 50; 52). The annual production in pounds of fish caught in Tampa Bay is approximately 11,900,000. However, information is not available detailing the amount of fish caught within the portion of Tampa Bay located along the target distance limit. Because East Bay, Hillsborough Bay, and Tampa Bay are commercially and recreationally fished, an annual production value of greater than zero was assigned for these areas (Refs. 50; 66).

Potential Human Food Chain Contamination Factor Value: 0.000003

4.1.4.2 WASTE CHARACTERISTICS

4.1.4.2.1 Ecosystem Toxicity × Persistence × Bioaccumulation

Hazardous Substance	Source No.	Eco. Tox. Factor Value (HRS Table 4-19)	Pers. Factor Value* (HRS Table 4-11)	Eco. Tox. × Pers. Factor Value (HRS Table 4-20)	References
Inorganics					
Antimony	2	100	1	100	2, p. BI-1
Arsenic	1, 2	100	1	100	2, p. BI-1
Barium	1, 2	1	1	1	2, p. BI-1
Beryllium	2	0	1	0	2, p. BI-2
Cadmium	1, 2	1,000	1	1,000	2, p. BI-2
Chromium	1, 2	100	1	100	2, p. BI-3
Copper	1, 2	1,000	1	1,000	2, p. BI-3
Cyanide	1	1,000	1	1,000	2, p. BI-4
Lead	1, 2	1,000	1	1,000	2, p. BI-8
Manganese	1, 2	0	1	0	2, p. BI-8
Mercury	1	10,000	1	10,000	2, p. BI-8
Nickel	1, 2	1,000	1	1,000	2, P. BI-9
Vanadium	1, 2	0	1	0	2, p. BI-11
Zinc	1, 2	100	1	100	2, p. BI-12
Organics					
Acenaphthane	1	1,000	0.4	400	2, p. BI-1
Acenaphthylene	1	0	0.4	0	2, p. BI-1
Acetophenone	2	NL	NL	NA	2, p. BI-1
Anthracene	1	10,000	0.4	4,000	2, p. BI-1
Benzeldehyde	1, 2	NL	NL	NA	2, p. BI-2
Benzo(a)anthracene	1, 2	10,000	1	10,000	2, p. BI-2
Benzo(a)pyrene	1, 2	1,000	1	1,000	2, p. BI-2
Benzo(b)fluoranthene	1, 2	NL	NL	NA	2, p. BI-2
Benzo(ghi)perylene	1	0	1	0	2, p. BI-2
Benzo(k)fluoranthene	1, 2	0	1	0	2, p. BI-2
Bis(2-ethylhexyl)-phthalate	1, 2	1,000	1	1,000	2, p. BI-2
Butylbenzylphthalate	1, 2	1,000	1	1,000	2, p. BI-2
Carbazole	1	1,000	0.4	400	2, p. BI-2
Chrysene	1, 2	1,000	1	1,000	2, p. BI-3

Hazardous Substance	Source No.	Eco. Tox. Factor Value (HRS Table 4-19)	Pers. Factor Value* (HRS Table 4-11)	Eco. Tox. × Pers. Factor Value (HRS Table 4-20)	References
Organics (Concluded)					
Di-n-butyl phthalate	2	10,000	1	10,000	2, p. BI-4
Dibenzo(a,h)anthracene	1	0	1	0	2, p. BI-4
Dimethyl phthalate	2	NL	NL	NA	2, p. BI-5
Fluoranthene	1, 2	10,000	1	10,000	2, p. BI-2
Fluorene	1	1,000	1	1,000	2, p. BI-6
Hexachloroethane	2	NL	NL	NA	2, p. BI-8
Indeno(1,2,3-cd)pyrene	1, 2	0	1	0	2, p. BI-8
Naphthalene	2	1,000	0.4	400	2, p. BI-9
Pentachlorophenol	1	1,000	1	1,000	2, p. BI-9
Phenanthrene	1, 2	10,000	0.4	4,000	2, p. BI-9
Phenol	2	1,000	0.0007	0.7	2, p. BI-9
Pyrene	1, 2	10,000	1	10,000	2, p. BI-10

Notes:

*Ecosystem toxicity factor value for salt water.
**Persistence factor value for rivers.

NL - Not listed. The value for this substance is not provided in the Superfund Chemical Data Matrix (SCDM) (Ref. 2).
NA - Not applicable

Ecosystem Toxicity × Persistence Factor Value: 10,000

SWOF - Environmental Threat - Ecotoxicity × Persistence × Bioaccumulation

Hazardous Substance	Source No	Eco. Tox. × Pers. Factor Value (HRS Table 4-20)	Env. Bioacc. Pot. Factor Value* (Section 4.1.4.2.1.3)	Eco. Tox. × Pers. × Env. Bioacc. Pot. Factor Value (HRS Table 4-21)	References
Inorganics					
Antimony	2	100	50	5,000	2, p. BI-1
Arsenic	1, 2	100	500	50,000	2, p. BI-1
Barium	1, 2	1	500	500	2, p. BI-1
Beryllium	2	0	50	0	2, p. BI-2
Cadmium	1, 2	1,000	50,000	5E+07	2, p. BI-2
Chromium	1, 2	100	500	50,000	2, p. BI-3
Copper	1, 2	1,000	50,000	5E+07	2, p. BI-3
Cyanide	1	1,000	0.5	500	2, p. BI-4
Lead	1, 2	1,000	5,000	5E+06	2, p. BI-8
Manganese	1, 2	0	50,000	0	2, p. BI-8
Mercury	1	10,000	50,000	5E+08	2, p. BI-8
Nickel	1, 2	1,000	500	5E+05	2, P. BI-9
Vanadium	1, 2	0	500	0	2, p. BI-11
Zinc	1, 2	100	50,000	5E+06	2, p. BI-12
Organics					
Acenaphthane	1	400	500	2E+05	2, p. BI-1
Acenaphthylene	1	0	500	0	2, p. BI-1
Acetophenone	2	NA	NL	NA	2, p. BI-1
Anthracene	1	4,000	50,000	2E+08	2, p. BI-1
Benzeldehyde	1, 2	NA	NL	NA	2, p. BI-2
Benzo(a)anthracene	1, 2	10,000	50,000	5E+08	2, p. BI-2
Benzo(a)pyrene	1, 2	1,000	50,000	5E+07	2, p. BI-2
Benzo(b)fluoranthene	1, 2	NA	NL	NA	2, p. BI-2
Benzo(ghi)perylene	1	0	50,000	0	2, p. BI-2
Benzo(k)fluoranthene	1, 2	0	50,000	0	2, p. BI-2
Bis(2-ethylhexyl)-phthalate	1, 2	1,000	5,000	5E+06	2, p. BI-2
Butylbenzylphthalate	1, 2	1,000	500	5E+05	2, p. BI-2
Carbazole	1	400	500	2E+05	2, p. BI-2
Chrysene	1, 2	1,000	500	5E+05	2, p. BI-3

Hazardous Substance	Source No	Eco. Tox. × Pers. Factor Value (HRS Table 4-20)	Env. Bioacc. Pot. Factor Value* (Section 4.1.4.2.1.3)	Eco. Tox. × Pers. × Env. Bioacc. Pot. Factor Value (HRS Table 4-21)	References
Organics (Concluded)					
Di-n-butyl phthalate	2	10,000	5,000	5E+07	2, p. BI-4
Dibenzo(a,h) anthracene	1	0	50,000	0	2, p. BI-4
Dimethyl phthalate	2	NA	NL	NA	2, p. BI-5
Fluoranthene	1, 2	10,000	5,000	5E+07	2, p. BI-2
Fluorene	1	1,000	5,000	5E+06	2, p. BI-6
Hexachloroethane	2	NA	NL	NA	2, p. BI-8
Indeno(1,2,3-cd)pyrene	1, 2	0	50,000	0	2, p. BI-8
Naphthalene	2	400	5,000	2E+06	2, p. BI-9
Pentachlorophenol	1	1,000	5,000	5E+06	2, p. BI-9
Phenanthrene	1, 2	4,000	5,000	2E+07	2, p. BI-9
Phenol	2	0.7	5	3.5	2, p. BI-9
Pyrene	1, 2	10,000	5,000	5E+07	2, p. BI-10

Notes:

*Ecosystem bioaccumulation factor value for salt water.

NL - Not listed. The value for this substance is not provided in the Superfund Chemical Data Matrix (SCDM) (Ref. 2).
NA - Not applicable

Ecosystem Toxicity × Persistence × Bioaccumulation Factor Value: 5E+08

4.1.4.2.2 Hazardous Waste Quantity

Source Number	Source Hazardous Waste Quantity Value (Section 2.4.2.1.5)	Are source hazardous constituent quantity data complete? (yes/no)
1	38.435	No
2	>0	No

Sum of values: 38.435
HWQ Factor Value: 100

If an Actual Contamination Target (drinking water, human food chain, or environmental threat) exists for the watershed, the calculated hazardous waste quantity score or a score of 100, whichever is greater, is assigned. If no Actual Contamination Targets exist, the hazardous waste quantity score calculated for sources available to migrate to surface water is assigned (Ref. 1, Section 2.4.2.2, Table 2-6).

Level II concentrations have been documented in the HRS eligible wetlands (see Section 4.1.4.3.1.2 of this HRS documentation record); therefore, a hazardous waste quantity of 100 is assigned.

4.1.4.2.3 Waste Characteristics Factory Category Value

HWQ factor value: 100

Ecosystem Toxicity factor value × Persistence factor value: 10,000

Ecosystem Bioaccumulation factor value: 50,000

Ecosystem Toxicity factor value × Persistence factor value (10,000) × HWQ factor value (100) × Ecosystem Bioaccumulation potential factor value (50,000): 5E+10

(Ref. 1, Section 2.4.3.2, Table 2-7)

Hazardous Waste Quantity Assigned Value: 100
Waste Characteristics Factor Category Value: 320

4.1.4.3 ENVIRONMENTAL THREAT - TARGETS

Level I Concentrations

No Level I concentrations have been documented; therefore, Level I concentrations were not evaluated.

Most Distant Level II Sample

1998 ESI Samples -

Sample ID: RSDS-10-SD/RSDS-10-SW

Distance from the probable point of entry:

975 feet from PPE No. 2
475 feet from PPE No. 3

References: 7, pp. 2, 3; 9, pp. 10, 16; 60

2002 Phase 2 RI Samples -

Sample ID: SD08

Distance from the probable point of entry:

600 feet from PPE No. 2
100 feet from PPE No. 3

References: 16, pp. 98, 511, 516; 60

4.3.1.4.3.1 SENSITIVE ENVIRONMENTS

4.1.4.3.1.1 Level I Concentrations

No Level I concentrations have been documented; therefore, Level I concentrations were not evaluated.

Level I Concentrations Factor Value: 0

4.1.4.3.1.2 Level II Concentrations

Sensitive Environments

-1998 ESI Samples-

Three surface water and co-located sediment sample pairs were collected within the birdfoot drainage canals located adjacent to the dump area in the northern portion of the property (RSDS-01-SW/SD; RSDS-02-SW/SD; and RSDS-03-SW/SD) (see Figure 3). Analytical results documented an observed release in all but surface water sample RSDS-03-SW (Refs. 7, pp. 4, 5, 9; 9, pp. 10, 14-17, Appendix A).

A Federally and state designated endangered species, the wood stork, has been sighted in the birdfoot drainage canals and been reported to inhabit the area (Refs. 12, p. 1; 16, pp. 142, 145, 179). The wood stork nests colonially in a variety of inundated forested wetlands, including cypress strands and domes, mixed hardwood swamps, sloughs, and mangroves. Increasingly, the species is nesting in artificial habitats (e.g., impoundments and dredged areas with native or exotic vegetation) in north and central Florida (Ref. 64). The wood stork forages mainly in shallow water in freshwater marshes, swamps, lagoons, ponds, tidal creeks, flooded pastures and ditches, where they are attracted to falling water levels that concentrate food sources (mainly fish) (Ref. 64). According to the National Wetlands Inventory (NWI) Map of Tampa, Florida, the wetland areas contiguous with the birdfoot drainage canals are classified as palustrine forested broad-leaved evergreen and emergent narrow-leaved wetlands (Ref. 18, pp. 1-4, Attachment 2; 63). Since the birdfoot drainage canals are a habitat known to be used by wood storks, a sensitive environment value of 75 was assigned (Ref. 1, Table 4-23).

Sum of Non-wetland Sensitive Environments Value: Habitat known to be used by Federally designated endangered species (75) = 75

Wetlands

Birdfoot Drainage Canals

-1998 ESI Samples-

Three surface water and co-located sediment sample pairs were collected from the birdfoot drainage canals located adjacent to dump area in the northern portion of the property (RSDS-01-SW/SD; RSDS-02-SW/SD; and RSDS-03-SW/SD) (see Figure 3). One surface water and co-located sediment sample pair was also collected from the western drainage canal, downstream of its confluence with the birdfoot drainage canals, approximately 500 feet downstream of PPE No. 1. Analytical results documented an observed release in all but surface water sample RSDS-03-SW (Refs. 3, pp. 1, 2; 7, pp. 4, 5, 9; 9, pp. 10, 14-17, Appendix A).

A total of approximately 1,000 linear feet of wetland frontage contiguous with the birdfoot drainage canals were determined to be affected by Level II concentrations (Refs. 18, pp. pp. 1-4, Attachment 2; 60; 63). Reference No. 60 of this HRS documentation record delineates the wetland frontage. Since PPE No. 1 is located in a wetland, the wetland perimeter was measured to determine the frontage subject to actual contamination (Ref. 1, Sections 4.1.4.3.1.1 and 4.1.4.3.1.2).The power line easement that crosses the mapped wetland area was determined to be the western boundary of the wetland perimeter.

Delaney Creek

-1998 ESI Samples -

Surface water and sediment sample pair RSDS-08-SW/SD was collected from the needle rush marsh located southwest of RSD and contiguous with Delaney Creek. In addition, surface water and sediment sample pairs RSDS-07-SW/SD, RSDS-09-SW/SD, RSDS-10-SW/SD, and RSDS-11-SW/SD were collected directly from Delaney Creek. Analysis of the samples documented an observed release (Refs. 7, pp. 3, 5, 6; 9, pp. 10, 14-17, Appendix A). RSDS-10-SW/SD was the most distant downstream sample collected within the wetland area contiguous with

Delaney Creek and the western drainage canal. RSDS-10-SW/SD was collected approximately 950 feet downstream of PPE No. 2 and 475 feet downstream of PPE No. 3 (Refs. 3, pp. 1, 2; 7, p. 3; 9, p. 10; 60).

-2002 Phase 2 RI Samples -

Surface water and co-located sediment samples were collected from five sampling stations (SDSW07 through SDSW11) located in the needle rush marsh (Ref. 16, pp. 17-21, 98, 508-520). Analysis of the samples documented an observed release (Refs. 16, pp. 98, 508-511, 516, 1257-1262, 1482; 25, p. 2; 57; 58, pp. 28, 36, 53, 55-58; 67, pp. 1, 2, 582-607). SDSW08 was the most distant downstream sample collected within the wetland area contiguous with Delaney Creek. SDSW08 was collected approximately 600 feet downstream of PPE No. 2 and 100 feet downstream of PPE No. 3 (Refs. 3, pp. 1, 2; 16, pp. 98, 511, 516, 1482; 57; 67, pp. 1, 2, 590, 599-601, 607).

Based on the analytical results of samples collected during the ESI and Phase 2 RI, a total of approximately 2,300 linear feet (0.4 miles) of wetlands contiguous with Delaney Creek were determined to be affected by Level II concentrations (Refs. 18, pp. pp. 1-4, Attachment 2; 60; 63). Reference No. 60 of this HRS documentation record delineates the wetland frontage subject to Level II concentrations. The wetland frontage subject to actual contamination was determined by measuring the wetland perimeter since both PPE No. 2 and PPE No. 3 are located in the wetlands contiguous with Delaney Creek, and not in the stream channel of Delaney Creek. The wetland was measured beginning at PPE No. 2 and included the wetland area between PPE Nos. 2 and 3 and Delaney Creek, downstream to RSDS-10-SW/SW, the furthest downstream sample location documenting actual contamination (Ref. 1, Sections 4.1.4.3.1.1 and 4.1.4.3.1.2).

According to the National Wetlands Inventory (NWI) Map of Tampa, Florida, the wetlands contiguous with the birdfoot drainage canals are classified as palustrine forested broad-leaved evergreen with seasonally tidal, moderately brackish (mesohaline). The wetlands contiguous with Delaney Creek are classified as estuarine intertidal scrub/shrub broad-leaved evergreen. The island in Delaney Creek near the confluence with the western drainage canal is classified as estuarine intertidal forested broad-leaved evergreen (Ref. 18, pp. 1-4, Attachment 2; 63).

Wetlands

Total Wetland Frontage: 1,000 feet (birdfoot drainage canals wetlands) + 2,300 feet (Delaney Creek wetlands) = 3,300 feet (0.6 miles)

Wetland Value: 25

Sum of Sensitive Environments Value + Wetland Value: 100

Level II Concentrations Factor Value: 100

4.1.4.3.1.3 Potential Contamination

Sensitive Environments

Type of Surface Water Body	Sensitive Environment	Sensitive Environment Value	Reference(s)
Coastal tidal waters	Hillsborough Bay and Tampa Bay are habitats for the federally designated endangered manatee	75 × 1 = 75	1, Table 4-23; 20, pp. 3-47
Coastal tidal waters	Hillsborough Bay and Tampa Bay are habitats for the federally designated endangered leatherback sea turtle	75 × 1 = 75	1, Table 4-23; 20, pp. 3-47
Coastal tidal waters	Hillsborough Bay and Tampa Bay are habitats for the federally designated threatened bald eagle	75 × 1 = 75	1, Table 4-23; 20, pp. 3-47
Coastal tidal waters	Hillsborough Bay and Tampa Bay are habitats for the federally designated endangered hawksbill sea turtle	75 × 1 = 75	1, Table 4-23; 20, pp. 3-47
Coastal tidal waters	Hillsborough Bay and Tampa Bay are habitats for the federally designated endangered wood stork	75 × 1 = 75	1, Table 4-23; 20, pp. 3-47
Coastal tidal waters	Hillsborough Bay and Tampa Bay are habitats for the federally designated threatened eastern indigo snake	75 × 1 = 75	1, Table 4-23; 20, pp. 3-47
Coastal tidal waters	Hillsborough Bay and Tampa Bay are habitats for the federally designated endangered Florida Goldenaster	75 × 1 = 75	1, Table 4-23; 20, pp. 3-47
Coastal tidal waters	Hillsborough Bay and Tampa Bay are habitats for the state-threatened Least Tern	50 × 1 = 50	1, Table 4-23; 20, pp. 3-47
Coastal tidal waters	Hillsborough Bay and Tampa Bay are habitats for the state-endangered Sand Butterfly Pea	50 × 1 = 50	1, Table 4-23; 20, pp. 3-47
Coastal tidal waters	Tampa Bay is a habitat for the state-threatened Short-Tailed Snake	50 × 1 = 50	1, Table 4-23; 20, pp. 3-47
Coastal tidal waters	Tampa Bay is a habitat for the state-threatened Giant Orchid	50 × 1 = 50	1, Table 4-23; 20, pp. 3-47

Sum of Environment Value: 725

Wetlands

Surface Water Body	Type of Surface Water Body	Wetlands Frontage	Wetlands Value for Surface Water Body	Reference(s)
Birdfoot Drainage Canals Western Drainage Canal Delaney Creek	Small to moderate stream	0.5 miles	25	1, Table 4-24; 18, pp. 1-4, Attachment 2; 63
Hillsborough Bay Tampa Bay	Coastal tidal waters	37.2 miles	500	1, Table 4-24; 18, pp. 1-4, Attachment 2; 63

Total Wetland Frontage: 37.7 miles
Wetland Value: 525

Type of Surface Water Body	Sum of Sensitive Environment Values(S_i)	Wetlands Value (W_i)	Dilution Weight (D_i)	$D_i(W_i+S_i)$
Small to moderate stream	None identified	25	0.1	2.5
Coastal tidal waters	725	525	0.0001	0.125

Sum of $D_i(W_i + S_i)$: 2.625
Sum of $D_i(W_i + S_i) \div 10$: 0.2625

Potential Contamination Factor Value: 0.2625